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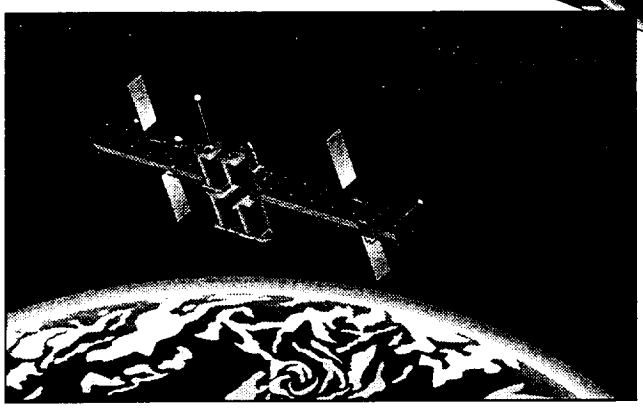

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This publication was prepared by the NASA Center for AeroSpace Information, 800 Elkridge Landing Road, Linthicum Heights, MD 21090-2934, (301) 621-0390.

INTRODUCTION

Several thousand inventions result each year from the aeronautical and space research supported by the National Aeronautics and Space Administration. The inventions having important use in government programs or significant commercial potential are usually patented by NASA. These inventions cover practically all fields of technology and include many that have useful and valuable commercial application.

NASA inventions best serve the interests of the United States when their benefits are available to the public. In many instances, the granting of nonexclusive or exclusive licenses for the practice of these inventions may assist in the accomplishment of this objective. This bibliography is published as a service to companies, firms, and individuals seeking new, licensable products for the commercial market.

The *NASA Patent Abstracts Bibliography (NASA PAB) is* a semiannual NASA publication containing comprehensive abstracts and indexes of NASA-owned inventions covered by U.S. patents and applications for patent. The citations included in *NASA PAB* were originally published in NASA's *Scientific and Technical Aerospace Reports (STAR)* and cover *STAR* announcements made since May 1969.

For the convenience of the user, each issue of *NASA PAB* has a separately bound Abstract Section (Section 1) and Index Section (Section 2). Although each Abstract Section covers only the indicated six-month period, the Index Section is cumulative covering all NASA-owned inventions announced in *STAR* since 1969. Thus a complete set of *NASA PAB* would consist of the Abstract Sections of Issue 04 (January 1974) and Issue 12 (January 1978) and the Abstract Section for all subsequent issues and the Index Section for the most recent issue.

The 85 citations published in this issue of the Abstract Section cover the period July 1995 through December 1995. The Index Section references over 5700 citations covering the period May 1969 through December 1995.

ABSTRACT SECTION (SECTION 1)

This *PAB* issue includes 10 major subject divisions separated into 76 specific categories and one general category/division. (See Table of Contents for the scope note of each category, under which are grouped appropriate NASA inventions.) This scheme was devised in 1975 and revised in 1987 in lieu of the 34 category divisions which were utilized in *PAB* supplements (01) through (06) covering *STAR* abstracts from May 1969 through January 1974. Each entry in the Abstract Section consists of a *STAR* citation accompanied by an abstract and, when appropriate, a key illustration taken from the patent or application for patent. Entries are arranged by subject category in order of the ascending NASA Accession Number originally assigned for *STAR* to the invention. The range of NASA Accession Numbers within each issue is printed on the inside back cover.

Abstract Citation Data Elements: Each of the abstract citations has several data elements useful for identification and indexing purposes, as follows:

NASA Accession Number
NASA Case Number
Inventor's Name
Title of Invention
U.S. Patent Application Serial Number
U.S. Patent Number (for issued patents only)
U.S. Patent Office Classification Number(s)
(for issued patents only)

These data elements are identified in the Typical Citation and Abstract and in the indexes.

INDEX SECTION (SECTION 2)

The Index Section is divided into five indexes. These indexes are cross-indexed and are used to locate a single invention or groups of inventions.

Subject Index: Lists all inventions according to appropriate alphabetized technical term and indicates the related NASA Case Number, the Subject Category Number, and the Accession Number.

Inventor Index: Lists all inventions according to alphabetized names of inventors and indicates the related NASA Case Number, the Subject Category Number, and the Accession Number.

Source Index: Lists all inventions according to alphabetized source of invention (i.e., name of contractor or government installation where invention was made) and indicates the related NASA Case Number, the Subject Category Number, and the Accession Number.

Number Index: Lists inventions in order of ascending (1) NASA Case Number, (2) U.S. Patent Application Serial number, (3) U.S. Patent Classification Number, and (4) U.S. Patent Number and indicates the related Subject Category Number and the Accession Number.

Accession Number Index: Lists all inventions in order of ascending Accession Number and indicates the related Subject Category Number, the NASA Case Number, the U.S. Patent Application Serial Number, the U.S.Patent Classification Number, and the U.S. Patent Number.

HOW TO USE THIS PUBLICATION TO IDENTIFY NASA INVENTIONS

To identify one or more NASA inventions within a specific technical field or subject, several techniques are possible with the flexibility incorporated into the *NASA PAB.*

(1) *Using Subject Category:* To identify all NASA inventions in any one of the subject categories in this issue of *NASA PAB,* select the desired Subject Category in the Abstract Section (Section 1) and find the inventions abstracted thereunder.

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TABLE OF CONTENTS
Section 1 • Abstracts

N.A. — no abstracts were assigned to this category for this issue.

CHEMISTRY AND MATERIALS

ENGINEERING For related information see also *Physics.*

GEOSCIENCES For related information see also *Space Sciences.*

LIFE SCIENCES

MATHEMATICAL AND COMPUTER SCIENCES

PHYSICS For related information see also *Engineering.*

SOCIAL SCIENCES

SPACE SCIENCES For related information see also *Geosciences.*

GENERAL

Includes aeronautical, astronautical, and space science related histories, biographies, and pertinent reports too broad for categorization; histories or broad overviews of NASA programs.

Section 2 • Indexes

TYPICAL CITATION AND ABSTRACT

NASA SPONSORED

ACCESSION NUMBER → **N95-22578*** National Aeronautics and Space Administration. Pasadena Office, CA. ← CORPORATE SOURCE

TITLE → **VIRTUAL REALITY FLIGHT CONTROL DISPLAY WITH SIX-DEGREE-OF-FREEDOM CONTROLLER AND SPHERICAL ORIENTATION OVERLAY Patent**

INVENTOR → BRIAN C. BECKMAN, inventor (to NASA) (Jet Propulsion Lab., California Inst. of Tech., Pasadena, CA.) 14 Feb. 1995 14 p Filed 23 Apr. 1993 Supersedes N93-30416 (31 - 11,p 3251)

CONTRACT OR GRANT NUMBER → (Contract(s)/Grant(s):NAS7-918)

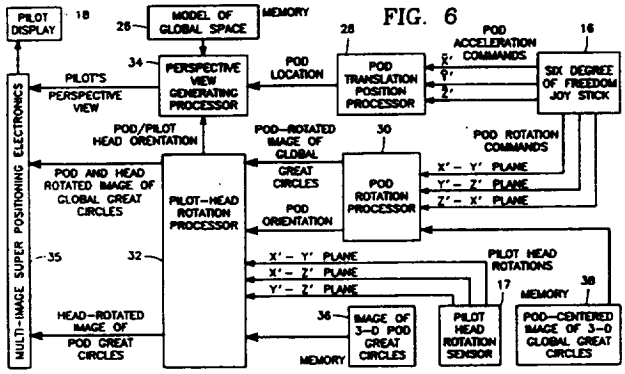
NASA CASE NUMBER AND US PATENT APPLICATION SERIAL NUMBER → (NASA-CASE-NPO-18733-1-CU; US-PATENT-5,388,990; US-PATENT-APPL-SN-056503; US-PATENT-CLASS-434-38; US-PATENT-CLASS-434-43; US-PATENT-CLASS-434-307R; US-PATENT-CLASS-434-372; US-PATENT-CLASS-364-578; US-PATENT-CLASS-395-152; US-PATENT-CLASS-345-8) Avail: US Patent and Trademark Office ← AVAILABILITY SOURCE

A virtual reality flight control system displays to the pilot the image of a scene surrounding a vehicle or pod having six degrees of freedom of acceleration or velocity control by the pilot and traveling through inertial space, the image itself including a superimposed figure providing the pilot an instant reference of orientation consisting of superimposed sets of geometric figures whose relative orientations provide the pilot an instantaneous feel or sense of orientation changes with respect to some fixed coordinate system. They include a first set of geometric figures whose orientations are fixed to the pilot's vehicle and a second set of geometric figures whose orientations are fixed with respect to a fixed or interstellar coordinate system. The first set of figures is a first set of orthogonal great circles about the three orthogonal axes of the flight vehicle or pod and centered at and surrounding the pilot's head, while the second set of figures is a second set of orthogonal great circles about the three orthogonal axes of a fixed or interstellar coordinate system, also centered at and surrounding the pilot's head.

← ABSTRACT

Official Gazette of the U.S. Patent and Trademark Office

FIG. 6



← KEY ILLUSTRATION

JANUARY 1996 (Supplement 48)

NASA Patent Abstracts Bibliography

A Semiannual Publication of the National Aeronautics and Space Administration

04
AIRCRAFT COMMUNICATIONS AND NAVIGATION

Includes digital and voice communication with aircraft; air navigation systems (satellite and ground based); and air traffic control.

N95-23393* National Aeronautics and Space Administration. Ames Research Center, Moffett Field, CA.
CUEING LIGHT CONFIGURATION FOR AIRCRAFT NAVIGATION Patent
MARY K. KAISER, inventor (to NASA) and WALTER J. JOHNSON, inventor (to NASA) 24 May 1994 9 p Filed 27 Aug. 1992
(NASA-CASE-ARC-11982-1; US-PATENT-5,315,296; US-PATENT-APPL-SN-935939; US-PATENT-CLASS-340-946; US-PATENT-CLASS-73-178H; US-PATENT-CLASS-340-953; US-PATENT-CLASS-340-961; US-PATENT-CLASS-340-981; US-PATENT-CLASS-362-62; INT-PATENT-CLASS-G08B-21/00) Avail: US Patent and Trademark Office

A pattern of light is projected from multiple sources located on an aircraft to form two clusters. The pattern of each cluster changes as the aircraft flies above and below a predetermined nominal altitude. The initial patterns are two horizontal, spaced apart lines. Each is capable of changing to a delta formation as either the altitude or the terrain varies. The direction of the delta cues the pilot as to the direction of corrective action.

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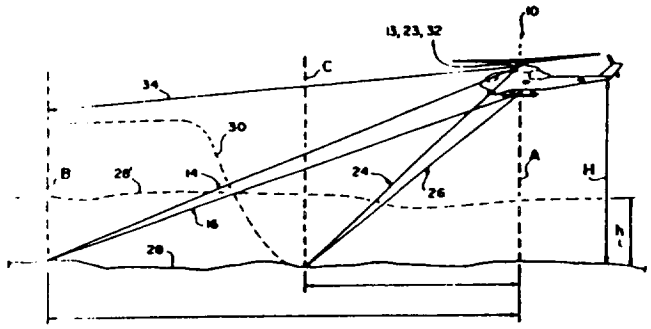


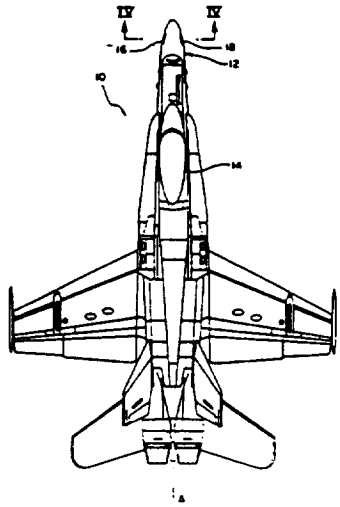
05
AIRCRAFT DESIGN, TESTING AND PERFOMANCE

Includes aircraft simulation technology.

N95-23390* National Aeronautics and Space Administration. Ames Research Center, Moffett Field, CA.
AERODYNAMIC SURFACE DISTENSION SYSTEM FOR HIGH ANGLE OF ATTACK FOREBODY VORTEX CONTROL Patent
PETER T. ZELL, inventor (to NASA) 5 Jul. 1994 10 p Filed 8 Feb. 1993
(NASA-CASE-ARC-11979-1; US-PATENT-5,326,050; US-PATENT-APPL-SN-014584; US-PATENT-CLASS-244-75R; US-PATENT-CLASS-244-199; INT-PATENT-CLASS-B64C-5/00) Avail: US Patent and Trademark Office

A deployable system is introduced for assisting flight control under certain flight conditions, such as at high angles of attack, whereby two inflatable membranes are located on the forebody portion of an aircraft on opposite sides thereof. The members form control surfaces for effecting lateral control forces if one is inflated and longitudinal control forces if both are inflated.

Official Gazette of the U.S. Patent and Trademark Office



N95-23395* National Aeronautics and Space Administration. Ames Research Center, Moffett Field, CA.
LIFT ENHANCING TABS FOR AIRFOILS Patent
JAMES C. ROSS, inventor (to NASA) 15 Mar.1994 9 p Filed 8 Feb. 1993
(NASA-CASE-ARC-11990-1; US-PATENT-5,294,080; US-PATENT-APPL-SN-014581; US-PATENT-CLASS-244-215; US-PATENT-CLASS-244-216; INT-PATENT-CLASS-B64C-9/16) Avail: US Patent and Trademark Office

A tab deployable from the trailing edge of a main airfoil element forces flow onto a following airfoil element, such as a flap, to keep the flow attached and thus enhance lift. For aircraft wings with high lift systems that include leading edge slats, the slats may also be provided with tabs to turn the flow onto the following main element.

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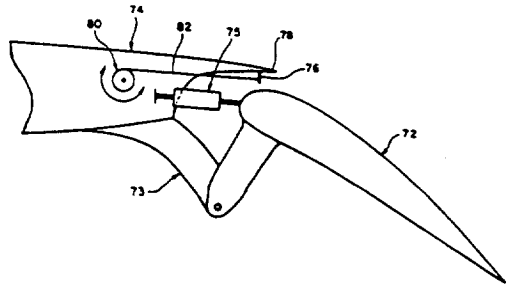

06
AIRCRAFT INSTRUMENTATION

Includes cockpit and cabin display devices; and flight instruments.

N95-22578* National Aeronautics and Space Administration. Pasadena Office, CA.
VIRTUAL REALITY FLIGHT CONTROL DISPLAY WITH SIX-DEGREE-OF-FREEDOM CONTROLLER AND SPHERICAL ORIENTATION OVERLAY Patent
BRIAN C. BECKMAN, inventor (to NASA) (Jet Propulsion Lab., California Inst. of Tech., Pasadena, CA.) 14 Feb. 1995 14 p Filed 23 Apr. 1993 Supersedes N93-30416 (31 - 11,p 3251)
(Contract(s)/Grant(s):NAS7-918)
(NASA-CASE-NPO-18733-1-CU; US-PATENT-5,388,990; US-PATENT-APPL-SN-056503; US-PATENT-CLASS-434-38; US-PATENT-CLASS-434-43; US-PATENT-CLASS-434-307R; US-PATENT-CLASS-434-372; US-PATENT-CLASS-364-578; US-PATENT-CLASS-395-152; US-PATENT-CLASS-345-8) Avail: US Patent and Trademark Office

A virtual reality flight control system displays to the pilot the image of a scene surrounding a vehicle or pod having six degrees of freedom of acceleration or velocity control by the pilot and traveling through inertial space, the image itself including a superimposed figure providing the pilot an instant reference of orientation consisting of superimposed sets of geometric figures whose relative orientations provide the pilot an instantaneous feel or sense of orientation changes with respect to some fixed coordinate system. They include a first set of geometric figures whose orientations are fixed to the pilot's vehicle and a second set of geometric figures whose orientations are fixed with respect to a fixed or interstellar coordinate system. The first set of figures is a first set of orthogonal great circles about the three orthogonal axes of the flight vehicle or pod and centered at and surrounding the pilot's head, while the second set of figures is a second set of orthogonal great circles about the three orthogonal axes of a fixed or interstellar coordinate system, also centered at and surrounding the pilot's head.

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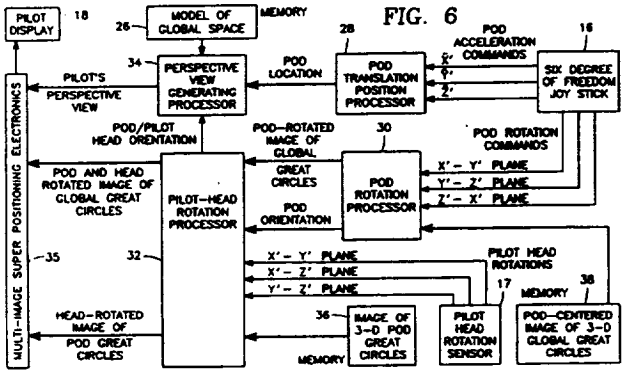

FIG. 6

08
AIRCRAFT STABILITY AND CONTROL

Includes aircraft handling qualities; piloting; flight controls; and autopilots.

N95-23389* National Aeronautics and Space Administration. Ames Research Center, Moffett Field, CA.

ENGINES-ONLY FLIGHT CONTROL SYSTEM Patent
FRANK W. BURCHAM, inventor (to NASA), GLENN B GILYARD, inventor (to NASA), JOSEPH L. CONLEY, inventor (to NASA), JAMES F. STEWART, inventor (to nASA), and CHARLES G. FULLERTON, inventor (to NASA) 19 Jul. 1994 18 p Filed 28 May 1992
(NASA-CASE-ARC-11944-1; US-PATENT-5,330,131; US-PATENT-APPL-SN-889347; US-PATENT-CLASS-244-75R; US-PATENT-CLASS-244-7R; US-PATENT-CLASS-244-182; US-PATENT-CLASS-244-51; INT-PATENT-CLASS-B64C-19/00) Avail: US Patent and Trademark Office

A backup flight control system for controlling the flightpath of a multi-engine airplane using the main drive engines is introduced. The backup flight control system comprises an input device for generating a control command indicative of a desired flightpath, a feedback sensor for generating a feedback signal indicative of at least one of pitch rate, pitch attitude, roll rate and roll attitude, and a control device for changing the output power of at least one of the main drive engines on each side of the airplane in response to the control command and the feedback signal.

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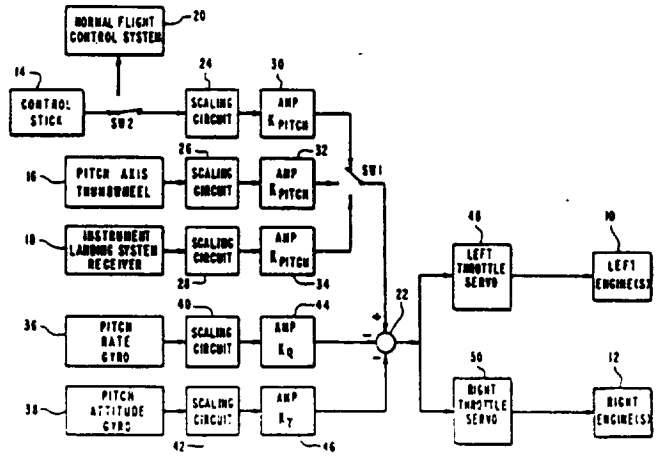

18
SPACECRAFT DESIGN, TESTING AND PERFORMANCE

Includes satellites; space platforms; space stations; spacecraft systems and components such as thermal and environmental controls; and attitude controls.

N95-27842*# National Aeronautics and Space Administration. Lyndon B. Johnson Space Center, Houston, TX.
PRE-INTEGRATED TRUSS SPACE STATION AND METHOD OF ASSEMBLY Patent
TIMOTHY E. PELISCHEK, inventor (to NASA), EDGAR O. CASTRO, inventor (to NASA), GREGG A. EDEEN, inventor (to NASA), DAVID A. HAMILTON, inventor (to NASA), JON B. KAHN, inventor (to NASA), JAMES B. MCDEDE, inventor (to NASA), KORNEL NAGY, inventor (to NASA), JOHN V. RIVERS, inventor (to NASA), IRENE E. VERINDER, inventor (to NASA), DONALD C. WADE, inventor (to NASA) et al. 18 Apr. 1995 9 p Filed 24 Dec. 1992 Supersedes N93-20042 (31 - 7, p 1823)

(NASA-CASE-MSC-22015-1; US-PATENT-5,407,152; US-PATENT-APPL-SN-996763; US-PATENT-CLASS-244-159; US-PATENT-CLASS-244-161; INT-PATENT-CLASS-B64G-1/10) Avail: US Patent and Trademark Office

The present invention is directed to methods and apparatus relating to design, construction, integration and assembly of a space station. The present invention uses pre-integrated open (unpressurized) truss segments for modular construction of the space station. Each segment includes a truss structure and utility subsystem which may be fully assembled and tested on Earth. The segments may be latched together on orbit using a remote latching system. Utility subsystems, such as solar panels and radiators, are pre-integrated into the appropriate truss segment, and are deployable from the respective truss segment on orbit. Rails run lengthwise along the assembled truss. The rails may be used with a mobile transporter for translating truss segments with respect to the spacecraft as part of the space station assembly process. The rails may also be used with a mobile transporter for carrying crew personnel, a robotic arm, and other equipment. With the present invention, the EVA time required for assembly as Space Station Freedom is markedly reduced.

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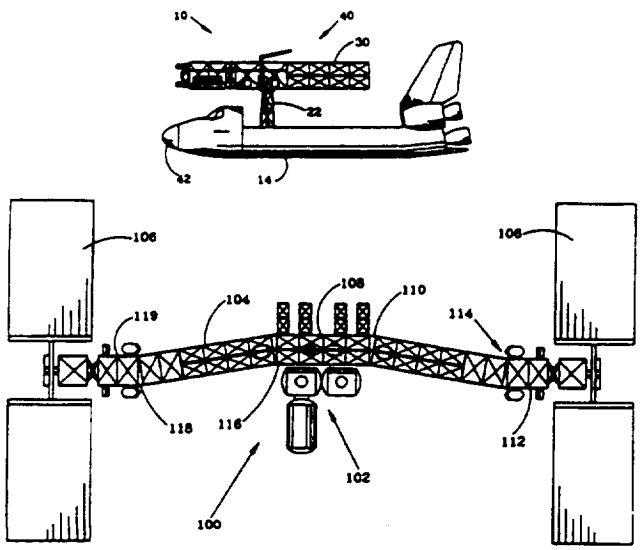

23
CHEMISTRY AND MATERIALS (GENERAL)

N95-28360* National Aeronautics and Space Administration. Langley Research Center, Hampton, VA.

POLY(N-ARYLENBENZIMIDAZOLES) VIA AROMATIC NUCLEOPHILIC DISPLACEMENT Patent

JOHN W. CONNELL, inventor (to NASA), PAUL M. HERGENROTHER, inventor (to NASA), and JOSEPH G. SMITH, JR., inventor (to NASA) 25 Apr. 1995 13 p Filed 5 Mar. 1993 (NASA-CASE-LAR-14939-1; US-PATENT-5,410,012; US-PATENT-APPL-SN-045339; US-PATENT-CLASS-528-125; US-PATENT-CLASS-528-128; US-PATENT-CLASS-528-171; US-PATENT-CLASS-528-172; US-PATENT-CLASS-528-174; US-PATENT-CLASS-528-183; INT-PATENT-CLASS-C08G-73/18) Avail: US Patent and Trademark Office

Novel poly(N-arylenebenzimidazole)s (PNABIs) are prepared by the aromatic nucleophilic displacement reaction of novel di(hydroxyphenyl-N-arylene benzimidazole) monomers with activated aromatic dihalides or activated aromatic dinitro compounds. The polymerizations are carried out in polar aprotic solvents such as N-methyl-2-pyrrolidinone or N,N-dimethylacetamide using alkali metal bases such as potassium carbonate at elevated temperatures under nitrogen. The di(hydroxyphenyl N-arylenebenzimidazole) monomers are synthesized by reacting phenyl 4-hydroxybenzoate with bis (2-aminoanilino) arylenes in diphenylsulfone. Moderate molecular weight PNABIs of new chemical structures were prepared that exhibit a favorable combination of physical and mechanical properties. The use of the novel di(hydroxyphenylN-arylene benzimidazole)s permits a more economical and ea si er way to prepare PNABIs than previous routes.

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N95-28361* National Aeronautics and Space Administration. Langley Research Center, Hampton, VA.

POLYBENZIMIDAZOLES VIA AROMATIC NUCLEOPHILIC DISPLACEMENT Patent

JOHN W. CONNELL, inventor (to NASA), PAUL M. HERGENROTHER, inventor (to NASA), and JOSEPH G. SMITH, JR., inventor (to NASA) 2 May 1995 18 p Filed 5 Apr. 1993 (NASA-CASE-LAR-14924-1-CU; US-PATENT-5,412,059; US-PATENT-APPL-SN-045335; US-PATENT-CLASS-528-183; US-PATENT-CLASS-528-125; US-PATENT-CLASS-528-126; US-PATENT-CLASS-528-128; US-PATENT-CLASS-528-172; US-PATENT-CLASS-528-174; US-PATENT-CLASS-528-210) Avail: US Patent and Trademark Office

Novel molecular weight controlled and endcapped polybenzimidazoles (PBI) are prepared by the aromatic nucleophilic displacement reaction of di(hydroxyphenyl benzimidazole) monomers with activated aromatic dihalides or activated aromatic dinitro compounds. The PBI are endcapped with mono(hydroxyphenyl) benzimidazoles. The polymerizations are carried out in polar aprotic solvents such as N-methyl-2-pyrrolidinone or N,N-dimethylacetamide using alkali metal bases such as potassium carbonate at elevated temperatures under nitrogen. Mono(hydroxyphenyl) benzimidazoles are synthesizedby reacting phenyl-4-hydroxybenzoate with aromatic (o-diamine)s in diphenylsulfone. Molecular weight controlled and endcapped PBI of new chemical structures are prepared that exhibit a favorable combination of physical and mechanical properties.

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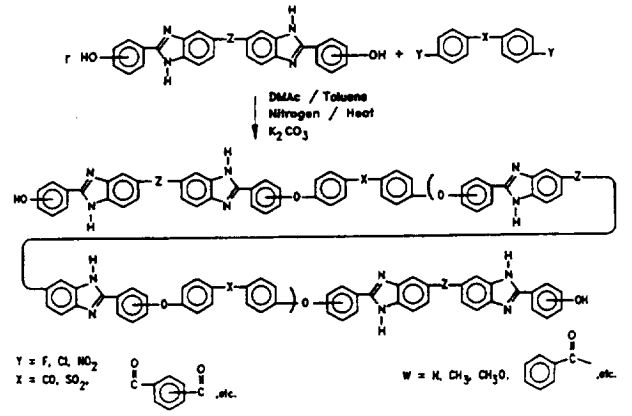

24
COMPOSITE MATERIALS

Includes physical, chemical, and mechanical properties of laminates and other composite materials.

N95-22563* National Aeronautics and Space Administration. Lewis Research Center, Cleveland, OH.
METHOD OF PRODUCING A SILICON CARBIDE FIBER REINFORCED STRONTIUM ALUMINOSILICATE GLASS-CERAMIC MATRIX COMPOSITE Patent
NAROTTAM P. BANSAL, inventor (to NASA) 14 Feb. 1995 4 p Filed 16 Sep. 1993 Supersedes N94-15929 (32 - 3, p 934) Division of abandonded US-Patent-Appl-SN-892054, filed 4 Jun. 1992 (NASA-CASE-LEW-15263-2; US-PATENT-5,389,321; US-PATENT-APPL-SN-128007; US-PATENT-APPL-SN-892054; US-PATENT-CLASS-264-60; US-PATENT-CLASS-264-63; US-PATENT-CLASS-264-166; US-PATENT-CLASS-264-332; US-PATENT-CLASS-501-8; US-PATENT-CLASS-501-95) Avail: US Patent and Trademark Office

A SrO-Al2O3-2SrO2 (SAS) glass ceramic matrix is reinforced with CVD SiC continuous fibers. This material is prepared by casting a slurry of SAS glass powder into tapes. Mats of continuous CVD-SiC fibers are alternately stacked with the matrix tapes. This tape-mat stack is warm-pressed to produce a 'green' composite. Organic constituents are burned out of the 'green' composite, and the remaining interim material is hot pressed.

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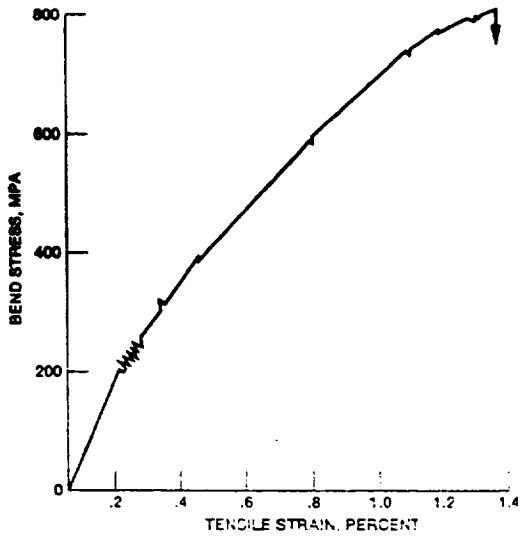

N95-25305* National Aeronautics and Space Administration. Langley Research Center, Hampton, VA.
METHOD AND APPARATUS FOR NON-DESTRUCTIVE EVALUATION OF COMPOSITE MATERIALS WITH CLOTH SURFACE IMPRESSIONS Patent
ERIC I. MADRAS, inventor (to NASA) 21 Feb. 1995 13 p Filed 16 Jul. 1993 Supersedes N94-15878 (32 - 3, p 933)
(NASA-CASE-LAR-14535-1; US-PATENT-5,390,544; US-PATENT-APPL-SN-110278; US-PATENT-CLASS-73/602; INT-PATENT-CLASS-G01N-9/24) Avail: US Patent and Trademark Office

A method and related apparatus for nondestructive evaluation of composite materials by determination of the quantity known as Integrated Polar Backscatter, which avoids errors caused by surface texture left by cloth impressions by identifying frequency ranges associated with peaks in a power spectrum for the backscattered signal, and removing such frequency ranges from the calculation of Integrated Polar Backscatter for all scan sites on the composite material is presented.

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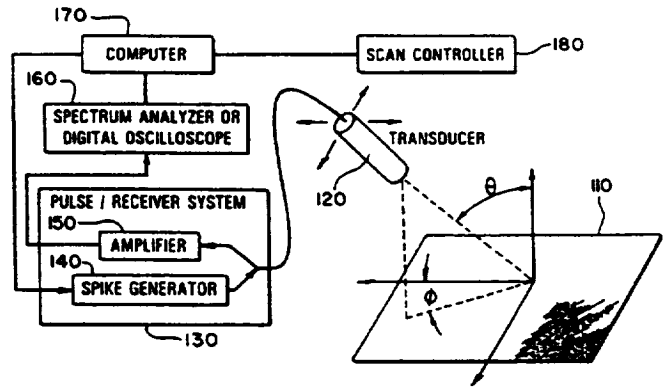
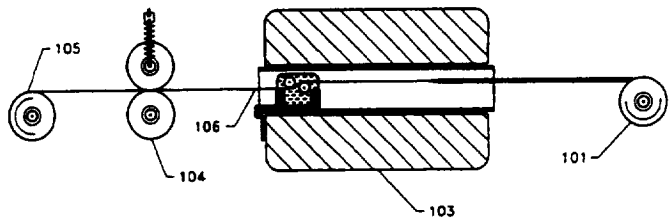


N95-25546* National Aeronautics and Space Administration. Langley Research Center, Hampton, VA.
APPARATUS FOR CONSOLIDATING A PRE-IMPREGNATED, FILAMENT-REINFORCED POLYMERIC PREPREG MATERIAL Patent
DONALD A. SANDUSKY, inventor (to NASA) (College of William and Mary, Williamsburg, VA.) 7 Mar. 1995 10 p Filed 20 Oct. 1993 Supersedes N94-29496 (32 - 8, p 3180)
(NASA-CASE-LAR-15173-1-CU; US-PATENT-5,395,477; US-PATENT-APPL-SN-141292; US-PATENT-CLASS-156-441; US-PATENT-CLASS-156-180; US-PATENT-CLASS-156-181; US-PATENT-CLASS-156-433; US-PATENT-CLASS-118-124; US-PATENT-CLASS-264-136; US-PATENT-CLASS-264-174) Avail: US Patent and Trademark Office

An apparatus and method were developed for providing a uniform, consolidated, unidirectional, continuous, fiber-reinforced polymeric material. The apparatus comprises a supply means, a forming means, a shaping means, and a take-up means. The forming means further comprises a pre-melting chamber and a stationary bar assembly. The shaping means is a loaded cooled nip-roller apparatus. Forming takes place by heating a polymeric prepreg material to a temperature where the polymer becomes viscous and applying pressure gradients at separate locations along the prepreg material. Upon exiting the forming means, the polymeric prepreg material is malleable, consolidated, and flattened. Shaping takes place by passing the malleable, consolidated, flattened prepreg material through a shaped, matched groove in a loaded, cooled nip-roller apparatus to provide the final solid product.

Official Gazette of the U.S. Patent and Trademark Office



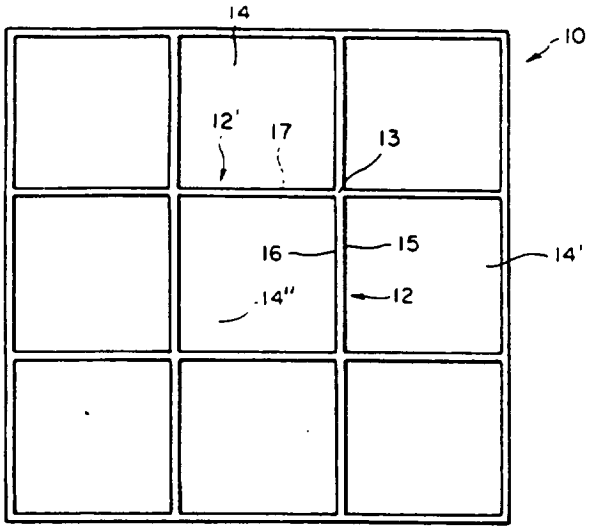
N95-26764*# National Aeronautics and Space Administration. Langley Research Center, Hampton, VA.

COMPOSITE SANDWICH STRUCTURE AND METHOD FOR MAKING SAME Patent Application

CHARLES J. MAGURANY, inventor (to NASA) (Lockheed Engineering and Sciences Co., Hampton, VA.) 30 Mar. 1995 32 p (NASA-CASE-LAR-14898-1; NAS 1.71:LAR-14898-1; US-PATENT-APPL-SN-413301) Avail: CASI HC A03/MF A01

A core for a sandwich structure which has multi-ply laminate ribs separated by voids is made as an integral unit in one single curing step. Tooling blocks corresponding to the voids are first wrapped by strips of prepreg layup equal to one half of each rib laminate so a continuous wall of prepreg material is formed around the tooling blocks. The wrapped tooling blocks are next pressed together laterally, like tiles, so adjoining walls from two tooling blocks are joined. The assembly is then cured by conventional methods, and afterwards the tooling blocks are removed so voids are formed. The ribs can be provided with integral tabs forming bonding areas for face sheets, and face sheets may be co-cured with the core ribs. The new core design is suitable for discrete ribcores used in space telescopes and reflector panels, where quasiisotropic properties and zero coefficient of thermal expansion are required.

NASA



N95-27192*# National Aeronautics and Space Administration. Langley Research Center, Hampton, VA.

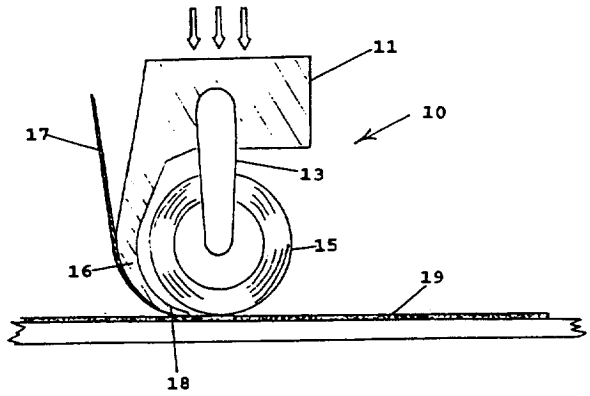
COMPOSITE PREPREG APPLICATION DEVICE Patent Application

DONALD A. SANDUSKY, inventor (to NASA) (College of William and Mary, Williamsburg, VA.) and JOSEPH M. MARCHELLO, inventor (to NASA) (Old Dominion Univ., Hampton, VA.) 21 Mar. 1995 14 p

(NASA-CASE-LAR-15259-1; NAS 1.71:LAR-15259-1; US-PATENT-APPL-SN-411231) Avail: CASI HC A03/MF A01

A heated shoe and cooled pressure roller assembly for composite prepreg application is provided. The shoe assembly includes a heated forward contact surface having a curved pressure surface. The following cooled roller provides a continuous pressure to the thermoplastic while reducing the temperature to approximately 5 C below glass transition temperature. Electric heating coils inside the forward portion of the shoe heat a thermoplastic workpiece to approximately 100 C above the glass transition. Immediately following the heated contact surface, a cooled roller cools the work. The end sharpened shape of the heated shoe trailing edge tends to prevent slag buildup and maintain a uniform, relaxed stress fabrication.

NASA



N95-27717*# National Aeronautics and Space Administration. Lewis Research Center, Cleveland, OH.

CERAMIC FIBER-REINFORCED MONOCLINIC CELSIAN PHASE GLASS-CERAMIC MATRIX COMPOSITE MATERIAL Patent Application

NAROTTAM P. BANSAL, inventor (to NASA) and JAMES A. DICARLO, inventor (to NASA) 31 Mar. 1994 14 p Continuation-in-part of US-Patent-Appl-SN-986399, filed 7 Dec. 1992 (NASA-CASE-LEW-15714-1; NAS 1.71:LEW-15714-1; US-PATENT-APPL-SN-221128; US-PATENT-APPL-SN-986399) Avail: CASI HC A03/MF A01

A hyridopolysilazane-derived ceramic fiber reinforced monoclinic celsian phase barium aluminum silicate glass-ceramic matrix composite material is prepared by ball-milling an aqueous slurry of BAS glass powder and fine monoclinic celsian seeds. The fibers improve the mechanical strength and fracture toughness and with the matrix provide superior dielectric properties.

NASA

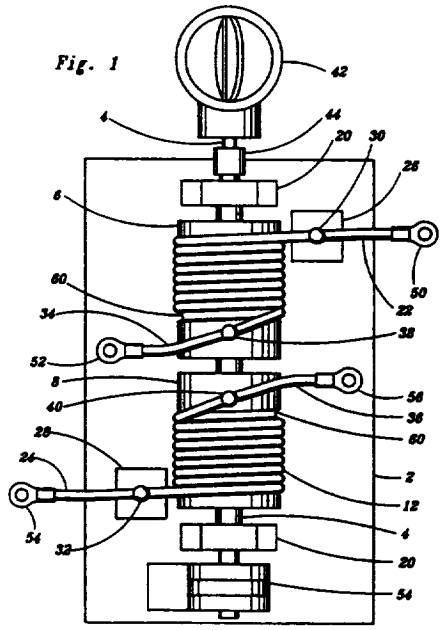
FIG. 1

26
METALLIC MATERIALS

Includes physical, chemical, and mechanical properties of metals, e.g., corrosion; and metallurgy.

N95-25545* National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, AL.
ROTARY ACTUATOR Patent
MYRON BRUDNICKI, inventor (to NASA) (Allied-Signal Corp., Morristown, NJ.) 14 Mar. 1995 6 p Filed 12 Oct. 1993 Supersedes N94-29447 (32 - 8, p 3205)
(NASA-CASE-MFS-28581-1; US-PATENT-5,396,769; US-PATENT-APPL-SN-134441; US-PATENT-CLASS-60-528; US-PATENT-CLASS-60-527; INT-PATENT-CLASS-F03G-7/00) Avail: US Patent and Trademark Office

Rotary actuators and other mechanical devices incorporating shape memory alloys are provided herein. Shape memory alloys are a group of metals which when deformed at temperatures below their martensite temperatures, resume the shapes which they had prior to the deformation if they are heated to temperatures above their austensite temperatures. Actuators in which shape memory alloys are employed include bias spring types, in which springs deform the shape memory alloy (SMA), and differential actuators, which use two SMA members mechanically connected in series. Another type uses concentric cylindrical members. One member is in the form of a sleeve surrounding a cylinder, both being constructed of shape memory alloys. Herein two capstans are mounted on a shaft which is supported in a framework. Each capstan is capable of rotating the shaft. Shape memory wire, as two separate lengths of wire, is wrapped around each capstan to form a winding around that capstan. The winding on one capstan is so wrapped that the wire is in a prestretched state. The winding on the other capstan is so wrapped that the wire is in a taut, but not a prestretched, state. Heating one performs work in one direction, thus deforming the other one. When the other SMA is heated the action is reversed.
Official Gazette of the U.S. Patent and Trademark Office



N95-26862*# National Aeronautics and Space Administration. Pasadena Office, CA.
ULTRA HIGH PURITY, DIMENSIONALLY STABLE INVAR 36 Patent Application
WITOLD M. SOKOLOWSKI, inventor (to NASA) (Jet Propulsion Lab., California Inst. of Tech., Pasadena, CA.), MARC S. LANE, inventor (to NASA) (Jet Propulsion Lab., California Inst. of Tech., Pasadena, CA.), TIMOTHY P. ODONNELL, inventor (to NASA) (Jet Propulsion Lab., California Inst. of Tech., Pasadena, CA.), and CHENG H. HSIEH, inventor (to NASA) (Jet Propulsion Lab., California Inst. of Tech., Pasadena, CA.) 23 Jun. 1994 23 p
(NASA-CASE-NPO-19358-1-CU; NAS 1.71:NPO-19358-1-CU; US-PATENT-APPL-SN-273511) Avail: CASI HC A03/MF A01

An INVAR 36 material having long-term dimensional stability is produced by sintering a blend of powders of nickel and iron under pressure in an inert atmosphere to form an alloy containing less than 0.01 parts of carbon and less than 0.1 part aggregate and preferably 0.01 part individually of Mn, Si, P, S and Al impurities. The sintered alloy is heat treated and slowly and uniformly cooled to form a material having a coefficient of thermal expansion of less than 1 ppm/C and a temporal stability of less than 1 ppm/year.
NASA

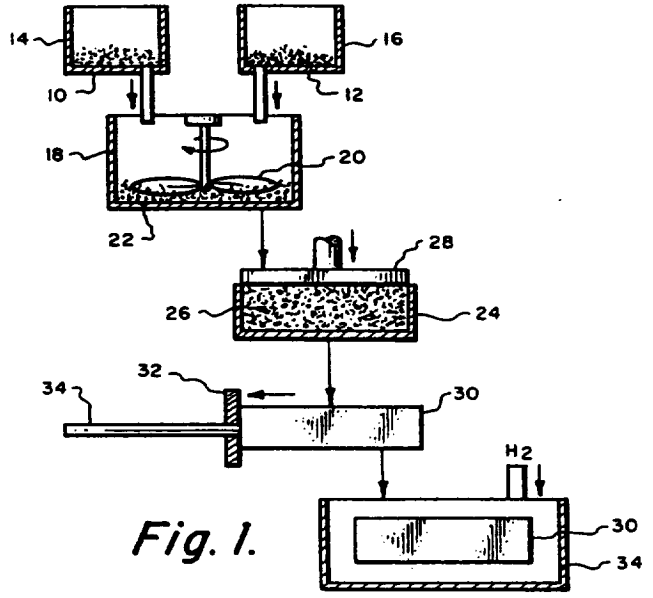


Fig. 1.

27
NONMETALLIC MATERIALS

Includes physical, chemical, and mechanical properties of plastics, elastomers, lubricants, polymers, textiles, adhesives, and ceramic materials.

N95-22558* National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, AL.
VACUUM VAPOR DEPOSITION Patent
RICHARD M. POORMAN, inventor (to NASA) and JACK L. WEEKS, inventor (to NASA) 10 Jan. 1995 6 p Filed 3 Feb. 1994 Supersedes N94-29446 (32 - 8, p 3215)

(NASA-CASE-MFS-28652-1; US-PATENT-5,380,415; US-PATENT-APPL-SN-191309; US-PATENT-CLASS-204-192.38; US-PATENT-CLASS-427-580; US-PATENT-CLASS-118-723VE; US-PATENT-CLASS-204-298.41; INT-PATENT-CLASS-C23C-14/00) Avail: US Patent and Trademark Office

A method and apparatus is described for vapor deposition of a thin metallic film utilizing an ionized gas arc directed onto a source material spaced from a substrate to be coated in a substantial vacuum while providing a pressure differential between the source and the substrate so that, as a portion of the source is vaporized, the vapors are carried to the substrate. The apparatus includes a modified tungsten arc welding torch having a hollow electrode through which a gas, preferably inert, flows and an arc is struck between the electrode and the source. The torch, source, and substrate are confined within a chamber within which a vacuum is drawn. When the arc is struck, a portion of the source is vaporized and the vapors flow rapidly toward the substrate. A reflecting shield is positioned about the torch above the electrode and the source to ensure that the arc is struck between the electrode and the source at startup. The electrode and the source may be confined within a vapor guide housing having a duct opening toward the substrate for directing the vapors onto the substrate.

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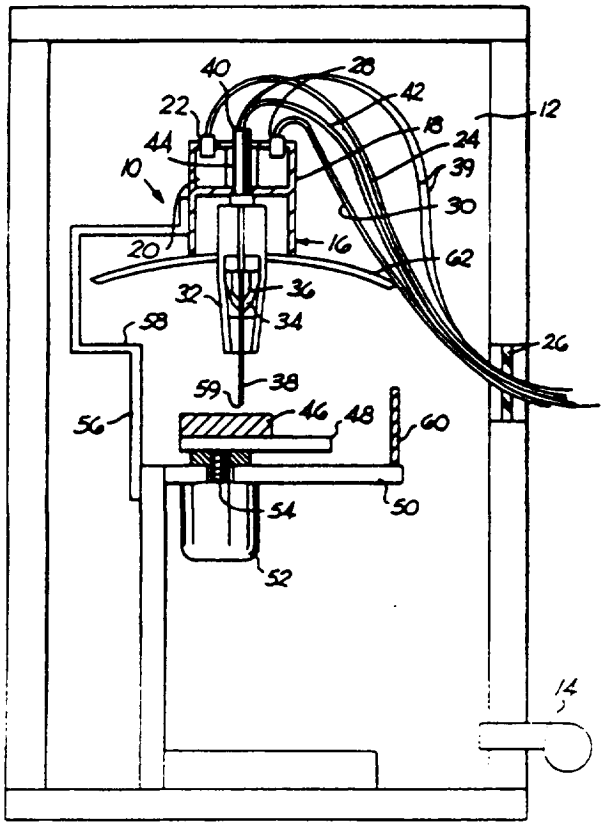

N95-22882*# National Aeronautics and Space Administration. Langley Research Center, Hampton, VA.

TOUGH, SOLUBLE, AROMATIC, THERMOPLASTIC COPOLYIMIDES Patent Application

ROBERT G. BRYANT, inventor (to NASA) 16 Dec. 1994 27 p (NASA-CASE-LAR-15205-1; NAS 1.71:LAR-15205-1; US-PATENT-APPL-SN-359752) Avail: CASI HC A03/MF A01

Tough, soluble, aromatic, thermoplastic copolyimides were prepared by reacting 4,4'-oxydiphthalic anhydride, 3,4,3',4'-biphenyltetracarboxylic dianhydride and 3,4'-oxydianiline. These copolyimides were found to be soluble in common amide solvents such as acetamide, Nmethylpyrrolidinone, and dimethylformamide allowing them to be applied as the fully imidized copolymer and to be used to prepare a wide range of articles.

NASA

N95-23253* National Aeronautics and Space Administration. Langley Research Center, Hampton, VA.

POLYAZOMETHINES CONTAINING TRIFLUOROMETHYLBENZENE UNITS Patent

ROBERT G. BRYANT, inventor (to NASA) 3 Jan. 1995 9 p Filed 30 Jul. 1993

(NASA-CASE-LAR-14896-1; US-PATENT-5,378,795; US-PATENT-APPL-SN-105251; US-PATENT-CLASS-528-244; US-PATENT-CLASS-528-230; US-PATENT-CLASS-528-232; US-PATENT-CLASS-528-243; US-PATENT-CLASS-528-266; INT-PATENT-CLASS-C08G-10/02) Avail: US Patent and Trademark Office

Soluble, amorphous, aromatic polyazomethine polymers and copolymers were prepared by reacting a dialdehyde monomer with a diamine monomer containing trifluoromethylbenzene and various combinations thereof in a solvent, such as N,N-dimethylacetamide. The reaction was heated to reflux yielding a polyazomethine which, after cooling to room temperature, was precipitated. These polymers and copolymers may be used to make films, coatings, composites and adhesives.

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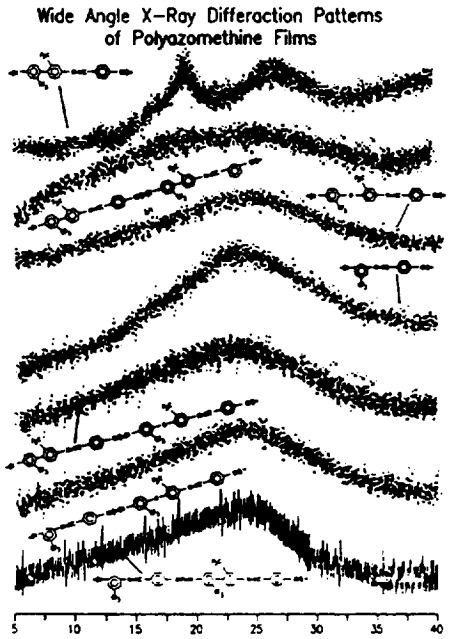

N95-23254* National Aeronautics and Space Administration. Langley Research Center, Hampton, VA.

PROCESS FOR PREPARING AN ASSEMBLY OF AN ARTICLE AND A POLYIMIDE WHICH RESISTS DIMENSIONAL CHANGE, DELAMINATION AND DEBONDING WHEN EXPOSED TO CHANGES IN TEMPERATURE Patent

DIANE M. STOAKLEY, inventor (to NASA) and ANNE K. ST.CLAIR, inventor (to NASA) 27 Dec. 1994 6 p Filed 20 Oct. 1993 Continuation of abandoned US-Patent-Appl-SN-736880, filed 26 Jul. 1991
NASA-CASE-LAR-14538-2; US-PATENT-5,376,209; US-PATENT-APPL-SN-141430; US-PATENT-APPL-SN-736880; US-PATENT-CLASS-156-330.9; US-PATENT-CLASS-427-96; US-PATENT-CLASS-427-207.1; US-PATENT-CLASS-427-430.1; US-PATENT-CLASS-156-60; INT-PATENT-CLASS-C09J-5/00) Avail: US Patent and Trademark Office

An assembly of an article and a polyimide composition is prepared. The assembly resists dimensional change, delamination, or debonding when exposed to changes in temperature. An article is provided. A polyamic acid solution which yields a polyimide having a low coefficient of thermal expansion (CTE) was prepared. Equimolar quantities of an aromatic diamine and an aromatic dianhydride were reacted in a solvent medium to form a polyamic acid solution. A metal ion-containing additive was added to the solution. Examples of this additive are: TbCl3, DyCl3, ErCl3, TmCl3, Al(C5H7O2)3, and Er2S3. The polyamic acid solution was imidized and is combined with the article to form the assembly.

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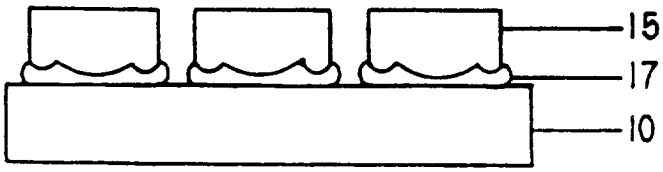

N95-23394* National Aeronautics and Space Administration. Ames Research Center, Moffett Field, CA.
PROTECTIVE COATING FOR CERAMIC MATERIALS Patent
DEMETRIUS A. KOURTIDES, inventor (to NASA), REX A. CHURCHWARD, inventor (to NASA), and DAVID M. LOWE, inventor (to NASA) 22 Mar. 1994 13 p Filed 9 Apr. 1992
NASA-CASE-ARC-11969-1-CU; US-PATENT-5,296,288; US-PATENT-APPL-SN-865535; US-PATENT-CLASS-428-262; US-PATENT-CLASS-428-268; US-PATENT-CLASS-428-289; US-PATENT-CLASS-428-325; US-PATENT-CLASS-428-331; US-PATENT-CLASS-428-469; INT-PATENT-CLASS-B32B-18/00) Avail: US Patent and Trademark Office

A protective coating for ceramic materials such as those made of silicon carbide, aluminum oxide, zirconium oxide, aluminoborosilicate and silicon dioxide, and a thermal control structure comprising a ceramic material having coated thereon the protective coating. The protective coating contains, in admixture, silicon dioxide powder, colloidal silicon dioxide, water, and one or more emittance agents selected from silicon tetraboride, silicon hexaboride, silicon carbide, molybdenum disilicide, tungsten disilicide and zirconium diboride. In another aspect, the protective coating is coated on a flexible ceramic fabric which is the outer cover of a composite insulation. In yet another aspect, a metallic foil is bonded to the outer surface of a ceramic fabric outer cover of a composite insulation via the protective coating. A primary application of this invention is as a protective coating for ceramic materials used in a heat shield for space vehicles subjected to very high aero-convective heating environments.

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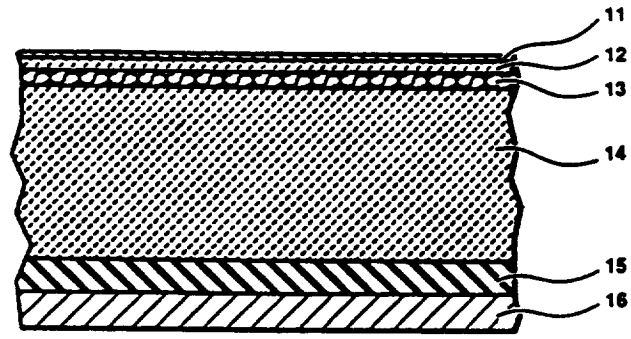
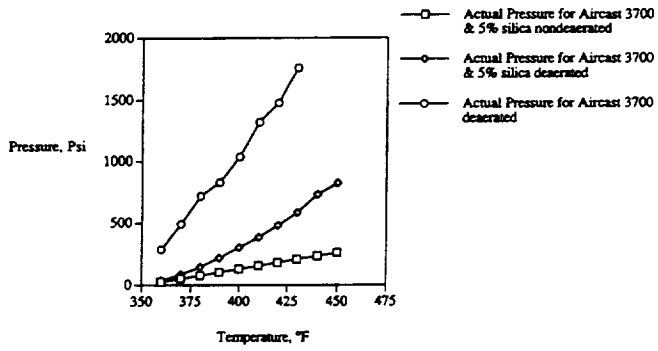


N95-24212*# National Aeronautics and Space Administration. Langley Research Center, Hampton, VA.
METHOD FOR MOLDING STRUCTURAL PARTS UTILIZING MODIFIED SILICONE RUBBER Patent Application
ERIK S. WEISNER, inventor (to NASA) (Weisner, Erik S., Santa Monica, CA.), ROBERT M. BAUCOM, inventor (to NASA), and JOHN J. SNOHA, inventor (to NASA) 12 Aug. 1994 14 p (NASA-CASE-LAR-15217-1; NAS 1.71:LAR-15217-1; US-PATENT-APPL-SN-292621) Avail: CASI HC A03/MF A01

This invention improves upon a method for molding structural parts from preform material. Preform material to be used for the part is provided. A silicone rubber composition containing entrained air voids is prepared. The silicone rubber and preform material assembly is situated within a rigid mold cavity used to shape the preform material to the desired shape. The entire assembly is heated in a standard heating device so that the thermal expansion on the silicone rubber exerts the pressure necessary to force the preform material into contact with the mold container. The introduction of discrete air voids into the silicone rubber allows for accurately controlled pressure application on the preform material at the cure temperature.

NASA



N95-26118* National Aeronautics and Space Administration. Langley Research Center, Hampton, VA.

METHOD AND APPARATUS FOR WEAVING CURVED MATERIAL PREFORMS Patent

GARY L. FARLEY, inventor (to NASA) 7 Mar. 1995 8 p Filed 10 Feb. 1993

(NASA-CASE-LAR-14752-1; US-PATENT-5,394,906; US-PATENT-APPL-SN-017205; US-PATENT-CLASS-139-192; US-PATENT-CLASS-139-11; US-PATENT-CLASS-139-384; US-PATENT-CLASS-139-305; US-PATENT-CLASS-428-175; INT-PATENT-CLASS-D03D-3/08; INT-PATENT-CLASS-D03D-41/00) Avail: US Patent and Trademark Office

A method and apparatus for fabricating straight or curved planar or three-dimensional (C channel, for example) fabric for fabrication into composite structures is presented. In the first embodiment, the fill yarns are inserted between layers of warp yarns, and a canted or curved reed, depending on the desired orientation of the fill yarns, is used to compact or 'beat-up' the fill yarns. In the second embodiment, the warp yarns of the fabric are curved using a conical or a combination of conical and cylindrical rollers to effect differential fabric take-up of the warp yarns for obtaining a constant radius of curvature of the warp yarns. In a third embodiment, a clamping bar fabric take-up device is used to effect the differential fabric take-up of the warp yarns for obtaining straight warp yarns, curved warp yarns with a constant radius of curvature, curved warp yarns with a non-contant radius of curvature, or some combinations of straight and curved warp yarns. In a fourth embodiment, for forming the flanges of the curved C channel, the warp yarns are alternately inserted through adjacent dent wires of the reed to permit vertical weaving of the flanges.

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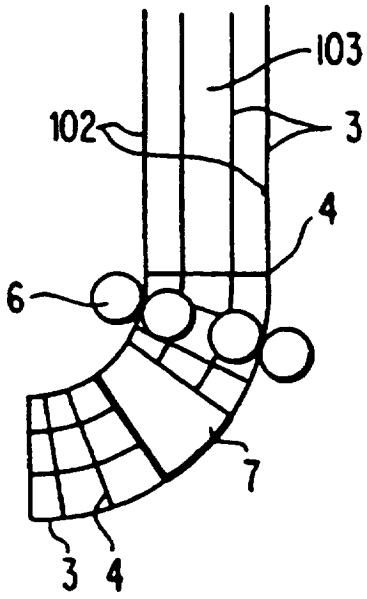


N95-27503*# National Aeronautics and Space Administration. Lewis Research Center, Cleveland, OH.

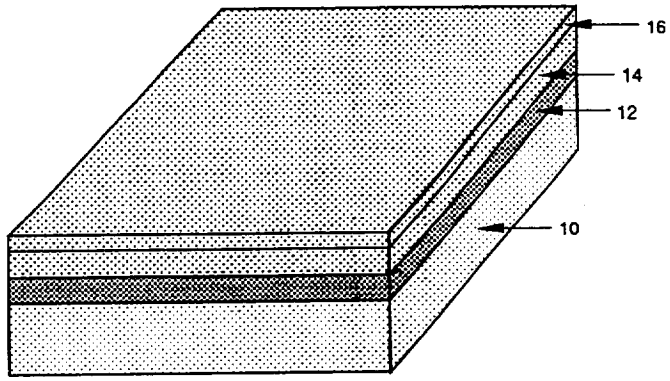
PREFERENTIALLY ETCHED EPITAXIAL LIFTOFF OF INP MATERIAL Patent Application

SHEILA G. BAILEY, inventor (to NASA), DAVID M. WILT, inventor (to NASA), and FRANK L. DEANGELO, inventor (to NASA) 27 Mar. 1995 11 p

(NASA-CASE-LEW-15760-1; NAS 1.71:LEW-15760-1; US-PATENT-APPL-SN-411357) Avail: CASI HC A03/MF A01

The present invention is directed toward a method of removing epitaxial substrates from host substrates. A sacrificial release layer of ternary material is placed on the substrate. A layer of InP is then placed on the ternary material. Afterward a layer of wax is applied to the InP layer to apply compressive force and an etchant material is used to remove the sacrificial release layer.

NASA



N95-27702*# National Aeronautics and Space Administration. Lewis Research Center, Cleveland, OH.

PROCESS FOR NON-CONTACT REMOVAL OF ORGANIC COATINGS FROM THE SURFACE OF PAINTINGS Patent Application

BRUCE A. BANKS, inventor (to NASA) and SHARON K. RUTLEDGE, inventor (to NASA) 11 May 1995 12 p

(NASA-CASE-LEW-15896-1; NAS 1.71:LEW-15896-1; US-PATENT-APPL-SN-439544) Avail: CASI HC A03/MF A01

The present invention discloses a method of removing organic protective coatings from a painting. In the present invention degraded protective coatings such as lacquers, acrylics, natural resins, carbons, soot, and polyurethane are safely removed from the surface of a painting without contact to the surface of the painting. This method can be used for restoration of paintings when they have been damaged, through age, fire, etc.

NASA

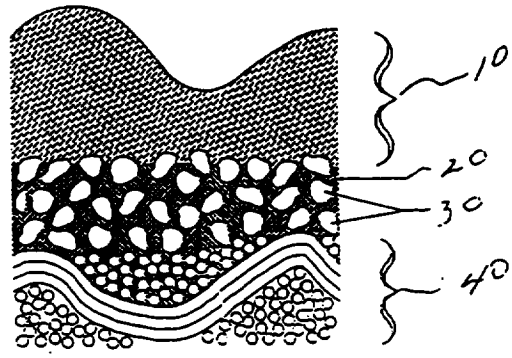


Figure 1

N95-27732* National Aeronautics and Space Administration. Langley Research Center, Hampton, VA.

PHENYLETHYNYL TERMINATED IMIDE OLIGOMERS Patent

PAUL M. HERGENROTHER, inventor (to NASA), ROBERT G. BRYANT, inventor (to NASA), BRIAN J. JENSEN, inventor (to NASA), and STEPHEN J. HAVENS, inventor (to NASA) 5 Feb. 1995 14 p Filed 3 Mar. 1994 Supersedes N95-14185 (33 - 3, p 450) (NASA-CASE-LAR-15175-1; US-PATENT-5,412,066; US-PATENT-APPL-SN-209512; US-PATENT-CLASS-528-353; US-PATENT-CLASS-528-128; US-PATENT-CLASS-528-172; US-PATENT-CLASS-528-173; US-PATENT-CLASS-528-174; US-PATENT-CLASS-528-176; US-PATENT-CLASS-528-183) Avail: US Patent and Trademark Office

Four phenylethynyl amine compounds - 3 and 4-aminophenoxy-4'-phenylethynylbenzophenone, and 3 and 4-amino-4'-phenylethynylbenzophenone - were readily prepared and were used to endcap imide oligomers. Phenylethynyl-terminated amide acid oligomers and phenylethynyl-terminated imide oligomers with various molecular weights and compositions were prepared and characterized. These oligomers were cured at 300 to 400 C to provide crosslinked polyimides with excellent solvent resistance, high strength and modulus, and good high temperature properties. Adhesive panels, composites, films, and moldings from these phenylethynyl terminated imide oligomers gave excellent mechanical performance.

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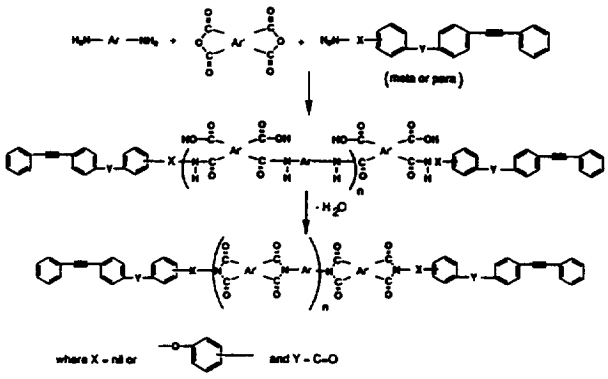

N95-28212* National Aeronautics and Space Administration. Ames Research Center, Moffett Field, CA.

BORON-CARBON-SILICON POLYMERS AND THE CERAMIC THEREOF Patent

SALVATORE R. RICCITIELLO, inventor (to NASA), MING-TA S. HSU, inventor (to NASA), and TIMOTHY S. CHEN, inventor (to NASA) 22 Jan. 1991 8 p Filed 5 Jun. 1989 (NASA-CASE-ARC-11891-1-SB; US-PATENT-4,987,201; US-PATENT-APPL-SN-361471; US-PATENT-CLASS-528-4; US-PATENT-CLASS-528-5; US-PATENT-CLASS-528-7; US-PATENT-CLASS-556-402; US-PATENT-CLASS-556-403; INT-PATENT-CLASS-C08G-79/08) Avail: US Patent and Trademark Office

The present invention relates to a process for the production of an organoborosilicon preceramic polymer. The prepolymer is pyrolyzed to produce a ceramic article useful in high temperature (e.g., aerospace) or extreme environmental applications.

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29
MATERIALS PROCESSING

Includes space-based development of products and processes for commercial applications.

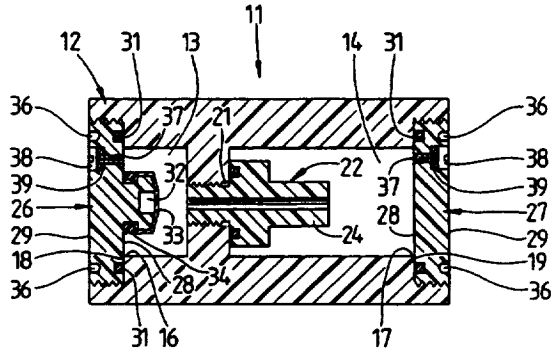
N95-26888*# National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, AL.

DEVICE AND METHOD FOR SCREENING CRYSTALLIZATION CONDITIONS IN SOLUTION CRYSTAL GROWTH Patent Application

DANIEL C. CARTER, inventor (to NASA) 17 Apr. 1995 43 p (NASA-CASE-MFS-28985-1; NAS 1.71:MFS-28985-1; US-PATENT-APPL-SN-422963) Avail: CASI HC A03/MF A01

A device and method for detecting optimum protein crystallization conditions and for growing protein crystals in either 1g or microgravity environments comprising a housing, defining at least one pair of chambers for containing crystallization solutions is presented. The housing further defines an orifice therein for providing fluid communication between the chambers. The orifice is adapted to receive a tube which contains a gelling substance for limiting the rate of diffusive mixing of the crystallization solutions. The solutions are diffusively mixed over a period of time defined by the quantity of gelling substance sufficient to achieve equilibration and to substantially reduce density driven convection disturbances therein. The device further includes endcaps to seal the first and second chambers. One of the endcaps includes a dialysis chamber which contains protein solution in which protein crystals are grown. Once the endcaps are in place, the protein solution is exposed to the crystallization solutions wherein the solubility of the protein solution is reduced at a rate responsive to the rate of diffusive mixing of the crystallization solutions. This allows for a controlled approach to supersaturation and allows for screening of crystal growth conditions at preselected intervals.

NASA



N95-27500*# National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, AL.

APPARATUS FOR DIFFUSION CONTROLLED DIALYSIS UNDER MICROGRAVITY CONDITIONS Patent Application

DANIEL C. CARTER, inventor (to NASA) 27 Feb. 1995 14 p (NASA-CASE-MFS-28986-1; NAS 1.71:MFS-28986-1; US-PATENT-APPL-SN-394862) Avail: CASI HC A03/MF A01

Apparatus for implementing crystal growth by allowing mixing of solutions under microgravity conditions includes a housing within which a number of pairs of chambers are formed. The chambers of each pair are aligned and a rotary valve is positioned between the

chambers of each pair. When the valve is in a first position one chamber of each pair may communicate with the other chamber. A separate valve is provided for each pair of chambers so that each pair of chambers may be activated independently of the others and sequentially at selected intervals. Protein solution may be located within a small cavity in a cap which closes one of the chambers of a pair, and the cavity in the cap is closed by a dialysis membrane. The length of certain pairs of chambers may differ from the length of other pairs of chambers to optimize conditions for various dialysis productions, and wicking material may be incorporated into selected chambers for controlling the critical approach to supersaturation.

NASA

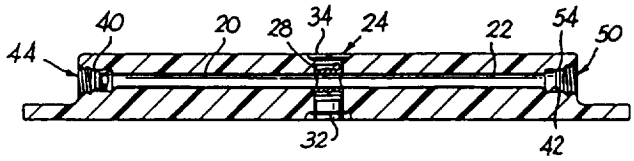


FIG. 2

32
COMMUNICATIONS AND RADAR

Includes radar; land and global communications; communications theory; and optical communications.

N95-25316* National Aeronautics and Space Administration. Pasadena Office, CA.

A SATELLITE-TRACKING MILLIMETER-WAVE REFLECTOR ANTENNA SYSTEM FOR MOBILE SATELLITE-TRACKING Patent

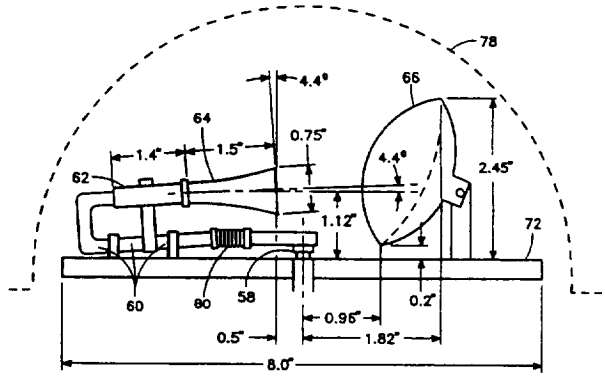
ARTHUR C. DENSMORE, inventor (to NASA) (Jet Propulsion Lab., California Inst. of Tech., Pasadena, CA.), VAHRAZ JAMNEJAD, inventor (to NASA) (Jet Propulsion Lab., California Inst. of Tech., Pasadena, CA.), and KENNETH E. WOO, inventor (to NASA) (Jet Propulsion Lab., California Inst. of Tech., Pasadena, CA.) 14 Mar. 1995 22 p Filed 30 Nov. 1992 Supersedes N93-28955 (31 -11, p 3381)

(Contract(s)/Grant(s): NAS7-918)

(NASA-CASE-NPO-18772-1-CU; US-PATENT-5,398,035; US-PATENT-APPL-SN-999794; US-PATENT-CLASS-343-713; US-PATENT-CLASS-343-786; US-PATENT-CLASS-343-840; INT-PATENT-CLASS-H01Q-19/12) Avail: US Patent and Trademark Office

A miniature dual-band two-way mobile satellite tracking antenna system mounted on a movable ground vehicle includes a miniature parabolic reflector dish having an elliptical aperture with major and minor elliptical axes aligned horizontally and vertically, respectively, to maximize azimuthal directionality and minimize elevational directionality to an extent corresponding to expected pitch excursions of the movable ground vehicle. A feed-horn has a back end and an open front end facing the reflector dish and has vertical side walls opening out from the back end to the front end at a lesser horn angle and horizontal top and bottom walls opening out from the back end to the front end at a greater horn angle. An RF circuit couples two different signal bands between the feed-horn and the user. An antenna attitude controller maintains an antenna azimuth direction relative to the satellite by rotating it in azimuth in response to sensed yaw motions of the movable ground vehicle so as to compensate for the yaw motions to within a pointing error angle. The controller sinusoidally dithers the antenna through a small azimuth dither angle greater than the pointing error angle while sensing a signal from the satellite received at the reflector dish, and deduces the pointing angle error from dither-induced fluctuations in the received signal.

Official Gazette of the U.S. Patent and Trademark Office



33
ELECTRONICS AND ELECTRICAL ENGINEERING

Includes test equipment and maintainability; components, e.g., tunnel diodes and transistors; microminiaturization; and integrated circuitry.

N95-24048*# National Aeronautics and Space Administration. Langley Research Center, Hampton, VA.

CIRCULAR ELECTRODE GEOMETRY METAL-SEMICONDUCTOR-METAL PHOTODETECTORS Patent Application

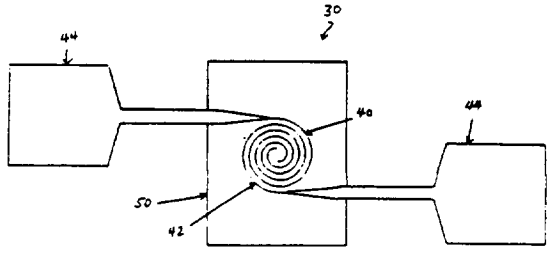
JAMES A. MCADDO, inventor (to NASA), ELIAS TOWE, inventor (to NASA) (Virginia Univ., Charlottesville, VA.), WILLIAM L. BISHOP, inventor (to NASA) (Bishop, William L., Charlottesville, VA.), and LIANG-GUO WANG, inventor (to NASA) (Wang, Liang-Guo, Hamp ton, VA.) 5 Jan. 1994 17 p

(Contract(s)/Grant(s): NAG1-1434)

(NASA-CASE-LAR-15172-1-CU; NAS 1.71:LAR-15172-1-CU; US-PATENT-APPL-SN-179598) Avail: CASI HC A03/MF A01

The invention comprises a high speed, metal-semiconductor-metal photodetector which comprises a pair of generally circular, electrically conductive electrodes formed on an optically active semiconductor layer. Various embodiments of the invention include a spiral, intercoiled electrode geometry and an electrode geometry comprised of substantially circular, concentric electrodes which are interposed. These electrode geometries result in photodetectors with lower capacitances, dark currents and lower inductance which reduces the ringing seen in the optical pulse response.

NASA



N95-25307* National Aeronautics and Space Administration. Pasadena Office, CA.

OPTICALLY-SWITCHED SUBMILLIMETER-WAVE OSCILLATOR AND RADIATOR HAVING A SWITCH-TO-SWITCH PROPAGATION DELAY Patent

MICHAEL G. SPENCER, inventor (to NASA) (Jet Propulsion Lab., California Inst. of Tech., Pasadena, CA.) and JOSEPH MASERJIAN, inventor (to NASA) (Jet Propulsion Lab., California Inst. of Tech., Pasadena, CA.) 28 Mar. 1995 15 p Filed 23 Sep. 1993 Supersedes N94-17324 (32 - 3, p 1014)

(Contract(s)/Grant(s): NAS7-918)

(NASA-CASE-NPO-18547-1-CU; US-PATENT-5,401,953; US-PATENT-APPL-SN-125966; US-PATENT-CLASS-250-208.4; US-PATENT-CLASS-330-4.5; US-PATENT-CLASS-372-4; US-PATENT-CLASS-250-214.1; INT-PATENT-CLASS-H01J-40/14) Avail: US Patent and Trademark Office

A submillimeter wave-generating integrated circuit includes an array of N photoconductive switches biased across a common voltage source and an optical path difference from a common optical pulse of repetition rate f sub 0 providing a different optical delay to each of the switches. In one embodiment, each incoming pulse is applied to successive ones of the N switches with successive delays. The N switches are spaced apart with a suitable switch-to-switch spacing so as to generate at the output load or antenna radiation of a submillimeter wave frequency f on the order of N f sub 0. Preferably, the optical pulse has a repetition rate of at least 10 GHz and N is of the order of 100, so that the circuit generates radiation of frequency of the order of or greater than 1 Terahertz.

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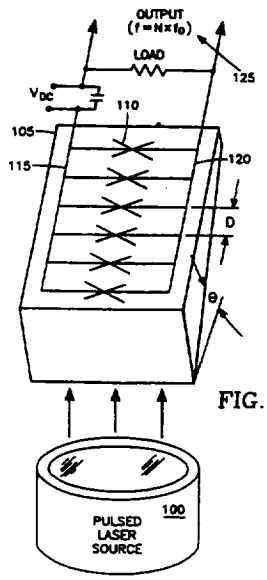

FIG. 1

N95-25889* National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, MD.

CIRCUIT FOR HIGH RESOLUTION DECODING OF MULTI-ANODE MICROCHANNEL ARRAY DETECTORS Patent

DAVID B. KASLE, inventor (to NASA) 7 Mar. 1995 16 p Filed 7 May 1992

(NASA-CASE-GSC-13478-1; US-PATENT-5,396,073; US-PATENT-APPL-SN-880099; US-PATENT-CLASS-250-385.1; US-PATENT-CLASS-250-214VT; US-PATENT-CLASS-364-413.13; INT-PATENT-CLASS-G01T-1/18) Avail: US Patent and Trademark Office

A circuit for high resolution decoding of multi-anode microchannel array detectors consisting of input registers accepting transient inputs from the anode array; anode encoding logic circuits connected to the input registers; midpoint pipeline registers connected to the anode encoding logic circuits; and pixel decoding logic circuits connected to the midpoint pipeline registers is described. A high resolution algorithm circuit operates in parallel with the pixel decoding logic circuit and computes a high resolution least significant bit to enhance the multianode microchannel array detector's spatial resolution by halving the pixel size and doubling the number of pixels in each axis of the anode array. A multiplexer is connected to the pixel decoding logic circuit and allows a user selectable pixel address output according to the actual multi-anode microchannel array detector anode array size. An output register concatenates the high resolution least significant bit onto the standard ten bit pixel address location to provide an eleven bit pixel address, and also stores the full eleven bit pixel address. A timing and control state machine is connected to the input registers, the anode encoding logic circuits, and the output register for managing the overall operation of the circuit.

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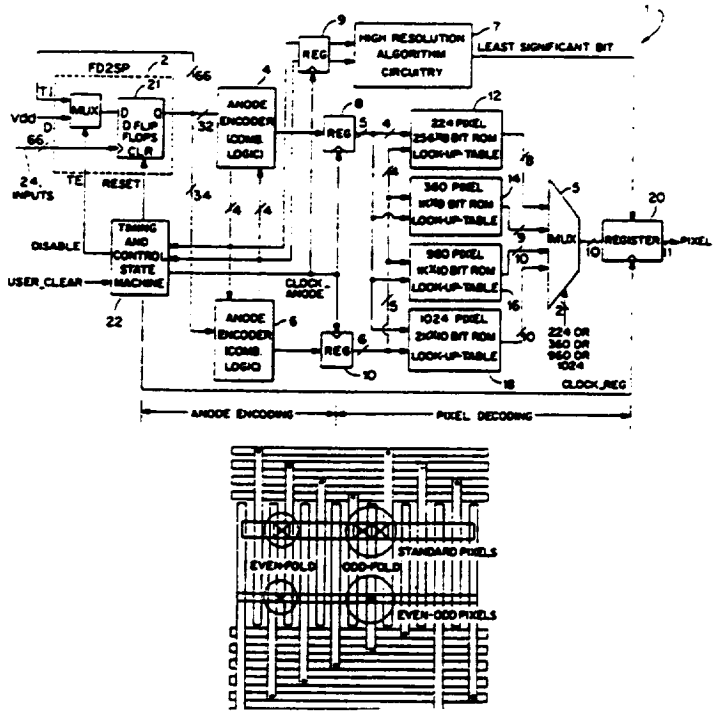

N95-26038* National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, MD.

HIGH INPUT IMPEDANCE AMPLIFIER Patent

LEONARD L. KLEINBERG 21 Mar. 1995 6 p Filed 26 Aug. 1993

(NASA-CASE-GSC-13571-1; US-PATENT-5,399,993; US-PATENT-APPL-SN-113373; US-PATENT-CLASS-330-293; US-PATENT-CLASS-330-291; US-PATENT-CLASS-330-292; US-PATENT-CLASS-330-294; US-PATENT-CLASS-330-109; INT-PATENT-CLASS-H03H-3/00) Avail: US Patent and Trademark Office

High input impedance amplifiers are provided which reduce the input impedance solely to a capacitive reactance, or, in a somewhat more complex design, provide an extremely high essentially infinite, capacitive reactance. In one embodiment, where the input imped-

ance is reduced in essence, to solely a capacitive reactance, an operational amplifier in a follower configuration is driven at its non-inverting input and a resistor with a predetermined magnitude is connected between the inverting and non-inverting inputs. A second embodiment eliminates the capacitance from the input by adding a second stage to the first embodiment. The second stage is a second operational amplifier in a non-inverting gain-stage configuration where the output of the first follower stage drives the non-inverting input of the second stage and the output of the second stage is fed back to the non-inverting input of the first stage through a capacitor of a predetermined magnitude. These amplifiers, while generally useful, are very useful as sensor buffer amplifiers that may eliminate significant sources of error.

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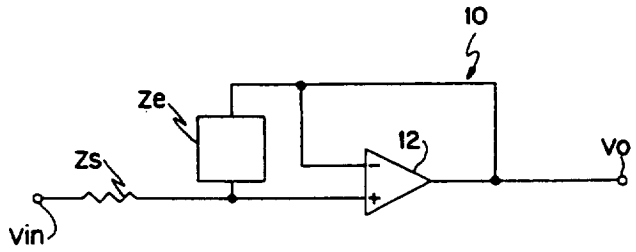

N95-26890*# National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, AL.

DYNAMICALLY TIMED ELECTRIC MOTOR Patent Application

ANN M. CASPER, inventor (to NASA) (United Technologies Corp., Huntsville, AL.) 29 Dec. 1994 12 p

(Contract(s)/Grant(s): NAS8-50000)

(NASA-CASE-MFS-28958-1; NAS 1.71:MFS-28958-1; US-PATENT-APPL-SN-365880) Avail: CASI HC A03/MF A01

The invention disclosed in this document is a brushless DC motor including a housing having an end cap secured thereto. The housing encloses a rotor, a stator and a rotationally displaceable commutation board having 5 sensors secured thereon and spaced around the periphery of the rotor. An external rotational force is applied to the commutation board for displacement of the sensors to various positions whereby varying feedback signals are generated by the positioning of the sensors relative to the rotating rotor. The commutation board is secured in a fixed position in response to feedback signals indicative of optimum sensor position being determined. The rotation of the commutation board and the securing of the sensors in the desired fixed position is accomplished without requiring the removal of the 5 end cap and with the DC motor operating.

NASA

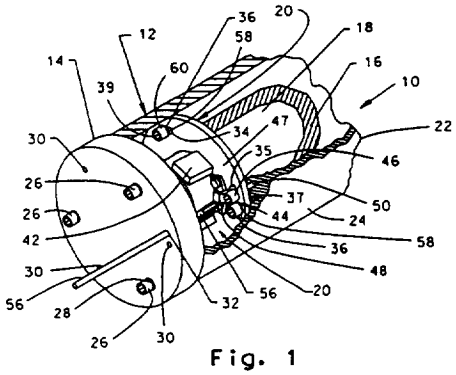

Fig. 1

N95-28341* National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, MD.

FORBACK DC-TO-DC CONVERTER Patent

ALAN T. LUKEMIRE, inventor (to NASA) 23 May 1995 33 p Filed 24 Mar. 1993

(NASA-CASE-GSC-13404-1; US-PATENT-5,418,709; US-PATENT-APPL-SN-038746; US-PATENT-CLASS-323-222; US-PATENT-CLASS-323-282; US-PATENT-CLASS-323-285; US-PATENT-CLASS-363-21; US-PATENT-CLASS-363-97; INT-PATENT-CLASS-G05F-1/613; INT-PATENT-CLASS-H02M-3/335) Avail: US Patent and Trademark Office

A pulse-width modulated DC-to-DC power converter including a first inductor, i.e. a transformer or an equivalent fixed inductor equal to the inductance of the secondary winding of the transformer, coupled across a source of DC input voltage via a transistor switch which is rendered alternately conductive (ON) and nonconductive (OFF) in accordance with a signal from a feedback control circuit is described. A first capacitor capacitively couples one side of the first inductor to a second inductor which is connected to a second capacitor which is coupled to the other side of the first inductor. A circuit load shunts the second capacitor. A semiconductor diode is additionally coupled from a common circuit connection between the first capacitor and the second inductor to the other side of the first inductor. A current sense transformer generating a current feedback signal for the switch control circuit is directly coupled in series with the other side of the first inductor so that the first capacitor, the second inductor and the current sense transformer are connected in series through the first inductor. The inductance values of the first and second inductors, moreover, are made identical. Such a converter topology results in a simultaneous voltsecond balance in the first inductance and ampere-second balance in the current sense transformer.

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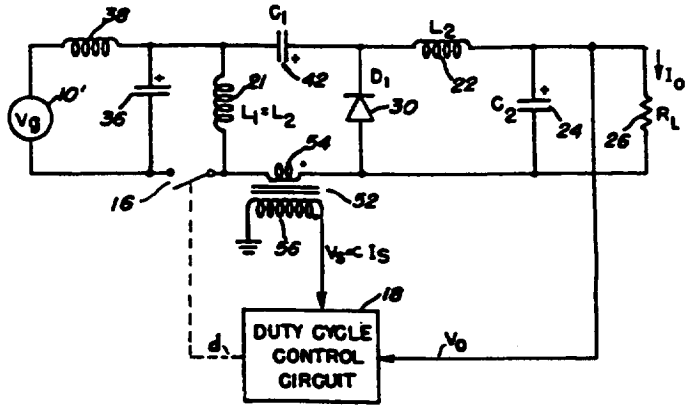

N95-28599* National Aeronautics and Space Administration. Pasadena Office, CA.

LEAK DETECTION UTILIZING ANALOG BINAURAL (VLSI) TECHNIQUES Patent

FRANK T. HARTLEY, inventor (to NASA) (Jet Propulsion Lab., California Inst. of Tech., Pasadena, CA.) 23 Jun. 1995 23 p Filed 18 Aug. 1993 Prepared in cooperation with Jet Propulsion Lab., California Inst. of Tech., Pasadena, CA

(Contract(s)/Grant(s): NAS7-918)

(NASA-CASE-NPO-18399-1-CU; US-PATENT-5,417,113; US-PATENT-APPL-SN-111317; US-PATENT-CLASS-73-587; US-PATENT-CLASS-73-592; US-PATENT-CLASS-381-68.2; US-PATENT-CLASS-367-125; INT-PATENT-CLASS-G01M-3/24) Avail: US Patent and Trademark Office

A detection method and system utilizing silicon models of the traveling wave structure of the human cochlea to spatially and temporally locate a specific sound source in the presence of high noise pandemonium. The detection system combines two-dimensional stereausis representations, which are output by at least three VLSI binaural hearing chips, to generate a three-dimensional stereausis representation including both binaural and spectral information which is then used to locate the sound source.

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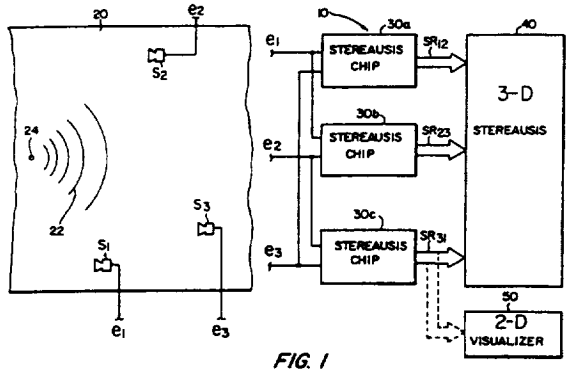

FIG. 1

34
FLUID MECHANICS AND HEAT TRANSFER

Includes boundary layers; hydrodynamics; fluidics; mass transfer; and ablation cooling.

N95-22906*# National Aeronautics and Space Administration. Langley Research Center, Hampton, VA.

MICRO-SENSOR THIN-FILM ANEMOMETER Patent Application

MARK SHEPLAK, inventor (to NASA) (Syracuse Univ., NY.), CATHERINE B. MCGINLEY, inventor (to NASA), ERIC F. SPINA, inventor (to NASA) (Syracuse Univ., NY.), RALPH M. STEPHENS, inventor (to NASA), PURNELL HOPSON, JR., inventor (to NASA), and VINCENT B. CRUZ, inventor (to NASA) 24 Nov. 1994 14 p (Contract(s)/Grant(s): NAG1-1400)

(NASA-CASE-LAR-15112-1-CU; NAS 1.71:LAR-15112-1-CU; US-PATENT-APPL-SN-361601) Avail: CASI HC A03/MF A01

A device for measuring turbulence in high-speed flows is provided which includes a micro-sensor thin-film probe. The probe is formed from a single crystal of aluminum oxide having a 14 deg half-wedge shaped portion. The tip of the half-wedge is rounded and has a thin-film sensor attached along the stagnation line. The bottom surface of the half-wedge is tilted upward to relieve shock induced disturbances created by the curved tip of the half-wedge. The sensor is applied using a microphotolithography technique.

NASA

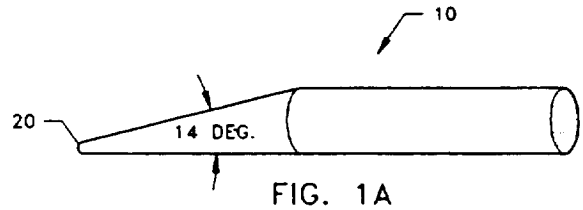

FIG. 1A

35
INSTRUMENTATION AND PHOTOGRAPHY

Includes remote sensors; measuring instruments and gages; detectors; cameras and photographic supplies; and holography.

N95-23263* National Aeronautics and Space Administration. Ames Research Center, Moffett Field, CA.

METHOD AND APPARATUS FOR MEASURING THE STRAIN DEVELOPED IN A COATED SURFACE Patent

SHELDON M. SMITH, inventor (to NASA) and CLEMENT C. HIEL, inventor (to NASA) 6 Apr. 1993 5 p Filed 21 Oct. 1991 (NASA-CASE-ARC-11938-1-C; US-PATENT-5,199,305; US-PATENT-APPL-SN-779672; US-PATENT-CLASS-73-851; US-PATENT-CLASS-73-150A; US-PATENT-CLASS-73-827; INT-PATENT-CLASS-G01N-3/20) Avail: US Patent and Trademark Office

A method and apparatus are provided for determining the strain developed in a coated surface. A beam with a coating on a surface thereof is mounted as a cantilever and a force is applied to the free end of the beam to cause deflection of the beam until the coating on the beam fails. The strain in the beam, and hence in the coating at the point of failure, is determined based on the dimensions of the beam, the point along the beam where failure of the coating occurs and the amount of deflection of the beam, and this determination is made independently of the temperature of the beam and the material from which the beam is made. The determination is made based on the equation E= 1.5hdx/l(exp 3), where E is strain, h is the beam thickness, d is the beam deflection, x is the distance from the free end of the beam to the point where failure of the coating occurred, and l is the length of the beam.

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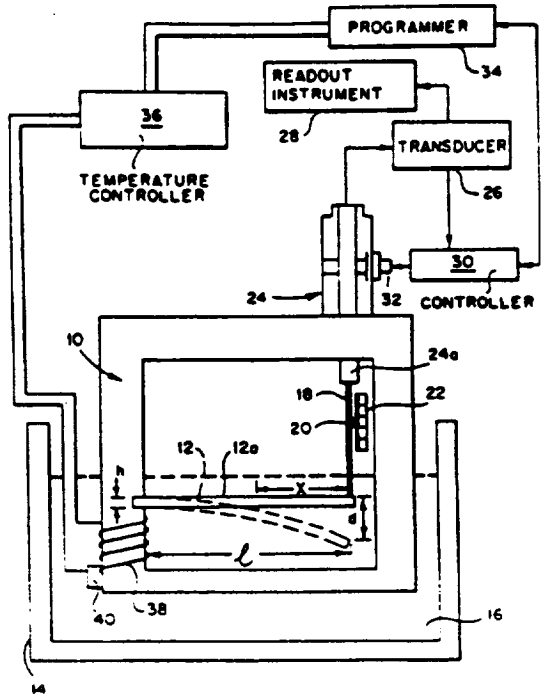

N95-23377* National Aeronautics and Space Administration. Ames Research Center, Moffett Field, CA.
SYSTEM FOR DETERMINING AERODYNAMIC IMBALANCE Patent
GARY B. CHURCHILL, inventor (to NASA) and BENNY K. CHEUNG, inventor (to NASA) 4 Oct. 1994 7 p Filed 7 Aug. 1992 (NASA-CASE-ARC-11913-1; US-PATENT-5,352,090; US-PATENT-APPL-SN-926117; US-PATENT-CLASS-416-61; US-PATENT-CLASS-416-34; INT-PATENT-CLASS-B64C-11/00) Avail: US Patent and Trademark Office

A system is provided for determining tracking error in a propeller or rotor driven aircraft by determining differences in the aerodynamic loading on the propeller or rotor blades of the aircraft. The system includes a microphone disposed relative to the blades during the rotation thereof so as to receive separate pressure pulses produced by each of the blades during the passage thereof by the microphone. A low pass filter filters the output signal produced by the microphone, the low pass filter having an upper cut-off frequency set below the frequency at which the blades pass by the microphone. A sensor produces an output signal after each complete revolution of the blades, and a recording display device displays the outputs of the low pass filter and sensor so as to enable evaluation of the relative magnitudes of the pressure pulses produced by passage of the blades by the microphone during each complete revolution of the blades.

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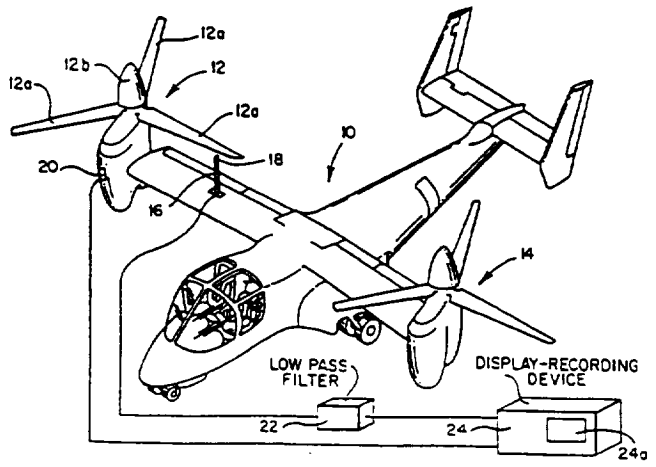

N95-24236* National Aeronautics and Space Administration. Ames Research Center, Moffett Field, CA.
LASER VELOCIMETER FOR NEAR-SURFACE MEASUREMENTS Patent
DENNIS A. JOHNSON, inventor (to NASA) 25 Feb. 1992 7 p Filed 11 Oct. 1990
(NASA-CASE-ARC-11917-1; US-PATENT-5,090,801; US-PATENT-APPL-SN-596105; US-PATENT-CLASS-356-28.5; US-PATENT-CLASS-356-28; INT-PATENT-CLASS-B01P-3/36) Avail: US Patent and Trademark Office

The present invention relates to a laser Doppler velocimeter for near-wall measurements which includes at least one beam-turning device. The beam-turning device receives laser light, reflects and redirects the light at various angles in order to obtain measurements for all three velocity components at grazing incident angles. The beam-turning device includes a mirror or prism at one end which reflects the received light in a particular direction. A collector lens receives the particle scattered light from which the relevant velocity components are determined. The beam-turning device can also be a miniature fiber optic head which outputs laser light and can be turned in any direction.

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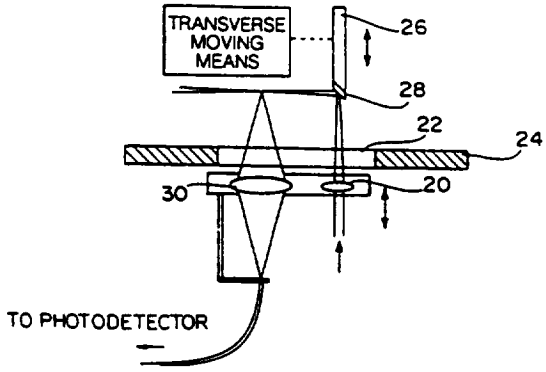

N95-24625* Moore (Thomas C., Sr.), Poquoson, VA.
COMPENSATED HIGH TEMPERATURE STRAIN GAGE Patent
27 Dec. 1994 6 p Filed 12 Aug. 1992
(NASA-CASE-LAR-14776-1; US-PATENT-5,375,474; US-PATENT-APPL-SN-928865; US-PATENT-CLASS-73-766; US-PATENT-CLASS-73-775; US-PATENT-CLASS-29-621.1; INT-PATENT-CLASS-G01B-7/16) Avail: US Patent and Trademark Office

A device for measuring strain in substrates at high temperatures in which the thermally induced apparent strain is nulled is described. Two gages are used, one active gage and one compensating gage. Both gages are placed on the substrate to be gaged; the active gage is attached such that it responds to mechanical and thermally induced apparent strain while the compensating gage is attached such that it does not respond to mechanical strain and and measures only thermally induced apparent strain. A thermal blanket is placed over the two gages to maintain the gages at the same temperature. The two gages are wired as adjacent arms of a wheatstone bridge which nulls the thermally induced apparent strain giving a true reading of the mechanical strain in the substrate.

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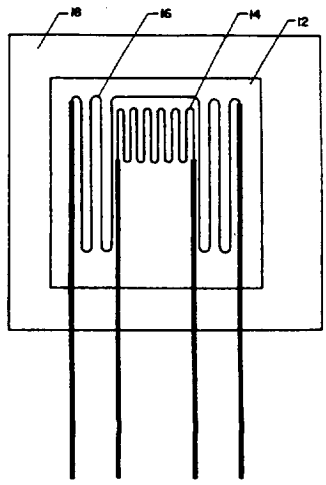


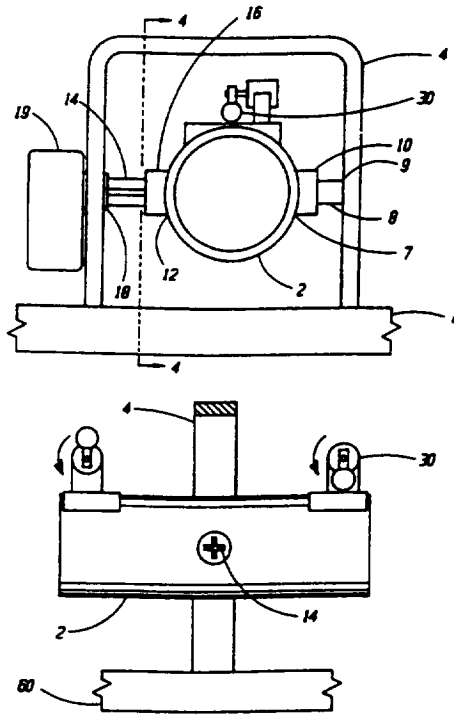
N95-25544* National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, AL.

SUSPENSION SYSTEM FOR GIMBAL SUPPORTED SCANNING PAYLOADS Patent

MICHAEL E. POLITES, inventor (to NASA) 14 Mar. 1995 9 p Filed 15 Sep. 1993 Supersedes N94-29358 (32-8, p 3287) (NASA-CASE-MFS-28817-1; US-PATENT-5,396,815; US-PATENT-APPL-SN-123629; US-PATENT-CLASS-74-61; US-PATENT-CLASS-74-87; US-PATENT-CLASS-244-158R; US-PATENT-CLASS-343-765; US-PATENT-CLASS-343-766; INT-PATENT-CLASS-F16H-33/20; INT-PATENT-CLASS-B64G-1/66) Avail: US Patent and Trademark Office

Gimballed scanning devices or instruments are the subject of this invention. Scanning is an important aspect of space science. To achieve a scan pattern some means must be provided which impart to the payload an oscillatory motion. Various forms of machines have been employed for controllably conferring on scanning instruments predetermined scan patterns. They include control moment gyroscopes, reaction wheels, torque motors, reaction control systems, and the like. But rotating unbalanced mass (RUM) devices are a new and efficient way to generate scans in gimballed payloads. RUM devices are superior to previous scanning apparatus, but they require power consuming and frequently complex auxiliary control systems to position and reposition the particular scan pattern relative to a target or a number of targets. Herein the control system is simplified. The most frequently employed method for achieving the various scan patterns is to gimbal the scanning device. Gimbals are suspended in such a way that they can be activated to generate the scan pattern. The suspension means described is for payloads supported in gimbals wherein the payload rotation is restricted by a flex pivot so that the payload oscillates, thereby moving in a scan pattern.

Official Gazette of the U.S. Patent and Trademark Office



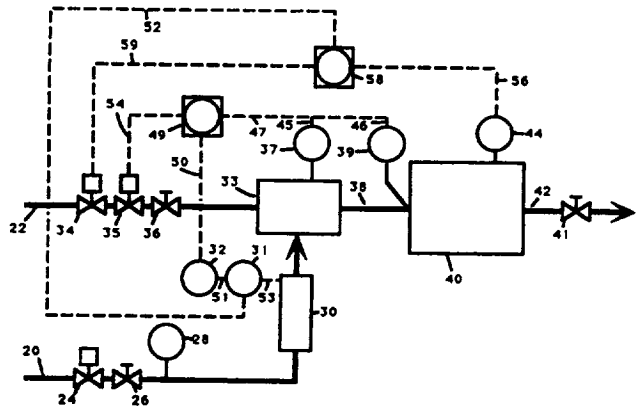
N95-25547* National Aeronautics and Space Administration. Pasadena Office, CA.

ALTERNATE METHOD FOR ACHIEVING TEMPERATURE CONTROL IN THE -160 TO +90 CELCIUS RANGE Patent

KENNETH R. JOHNSON, inventor (to NASA) (Jet Propulsion Lab., California Inst. of Tech., Pasadena, CA.) 7 Mar. 1995 19 p Filed 4 Nov. 1993 Supersedes N94-29497 (32 - 8, p 3288) (Contract(s)/Grant(s): NAS7-918)
(NASA-CASE-NPO-18995-1-CU; US-PATENT-5,394,704; US-PATENT-APPL-SN-152631; US-PATENT-CLASS-62-51.1; US-PATENT-CLASS-62-50.2; US-PATENT-CLASS-62-50.4; US-PATENT-CLASS-62-122; US-PATENT-CLASS-62-159; INT-PATENT-CLASS-F25B-19/00; INT-PATENT-CLASS-F17C-9/02) Avail: US Patent and Trademark Office

A single-pass method for accurate and precise temperature control in the -160 to +90 C range is discussed. The method exhibited minimal set-point overshoot during temperature transitions. Control to +/-2 C with transitions between set-points of 7 C per minute were achieved. The method uses commercially available temperature controllers and a gaseous nitrogen/liquid nitrogen mixer to dampen the amplitude of cold temperature spikes caused by liquid nitrogen pulsing.

Official Gazette of the U.S. Patent and Trademark Office



N95-26340* National Aeronautics and Space Administration. Pasadena Office, CA.

CONTINUOUS PHASE AND AMPLITUDE HOLOGRAPHIC ELEMENTS Patent

PAUL D. MAKER, inventor (to NASA) and RICHARD E. MULLER, inventor (to NASA) 28 Feb. 1995 13 p Filed 27 May 1993 (NASA-CASE-NPO-18791-1; US-PATENT-5,393,634; US-PATENT-APPL-SN-071131; US-PATENT-CLASS-430-1; US-PATENT-CLASS-430-320; US-PATENT-CLASS-430-2; US-PATENT-CLASS-430-942; US-PATENT-CLASS-430-296; US-PATENT-CLASS-250-492.22; US-PATENT-CLASS-250-492.3) Avail: US Patent and Trademark Office

A method for producing a phase hologram using e-beam lithography provides n-ary levels of phase and amplitude by first producing an amplitude hologram on a transparent substrate by e-beam exposure of a resist over a film of metal by exposing n is less than or equal to m x m spots of an array of spots for each pixel, where the spots are randomly selected in proportion to the amplitude assigned to each pixel, and then after developing and etching the metal film producing a phase hologram by e-beam lithography using a low contrast resist, such as PMMA, and n-ary levels of low

doses less than approximately 200 micro-C/sq cm and preferably in the range of 20-200 micro-C/sq cm, and aggressive development using pure acetone for an empirically determined time (about 6 s) controlled to within 1/10 s to produce partial development of each pixel in proportion to the n-ary level of dose assigned to it.

Official Gazette of the U.S. Patent and Trademark Office

N95-26765*# National Aeronautics and Space Administration. Pasadena Office, CA.

METHOD AND APPARATUS FOR POLARADIOMETRIC PYROMETER Patent Application

ALI A. ABTAHI, inventor (to NASA) (Jet Propulsion Lab., California Inst. of Tech., Pasadena, CA.) 22 Jun. 1994 20 p

(NASA-CASE-NPO-19064-1-CU; NAS 1.71:NPO-19064-1-CU; US-PATENT-APPL-SN-273542) Avail: CASI HC A03/MF A01

A radiation pyrometer for measuring the true temperature of a body is provided by detecting and measuring thermal radiation from the body based on the principle that the effects of angular emission I(sub 1) and reflection I(sub 2) on the polarization states p and s of radiation are complementary such that upon detecting the combined partial polarization state components I(sub p) = I(sub 1p) + I(sub 2p) and I(sub s) = I(sub 1s) + I(sub 2s) and adjusting the intensity of the variable radiation source of the reflected radiation I(sub 2) until the combined partial radiation components I(sub p) and I(sub s) are equal, the effects of emissivity as well as diffusivity of the surface of the body are eliminated, thus obviating the need for any post processing of brightness temperature data.

NASA

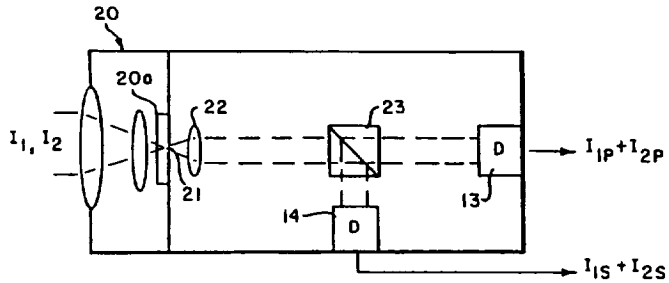


FIG.2

N95-27138*# National Aeronautics and Space Administration. Langley Research Center, Hampton, VA.

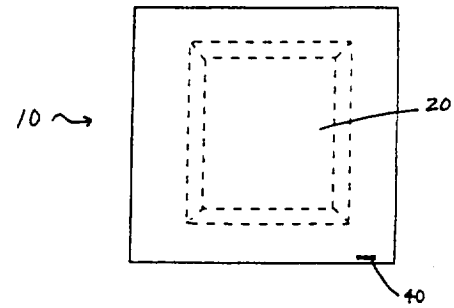
MULTI-CHANNEL ELECTRONICALLY SCANNED CRYOGENIC PRESSURE SENSOR Patent Application

JOHN J. CHAPMAN, inventor (to NASA) (Chapman, John J., Wareneck, VA.), PURNELL HOPSON, JR., inventor (to NASA) (Hopson, Purnell, Jr., Seaford, VA.), and NANCY M. H. KRUSE, inventor (to NASA) (Kruse, Nancy M. H., Hayes, VA.) 4 Apr. 1995 27 p

(NASA-CASE-LAR-15062-1; NAS 1.71:LAR-15062-1; US-PATENT-APPL-SN-416596) Avail: CASI HC A03/MF A01

A miniature, multi-channel, electronically scanned pressure measuring device uses electrostatically bonded silicon dies in a multielement array. These dies are bonded at specific sites on a glass, prepatterned substrate. Thermal data is multiplexed and recorded on each individual pressure measuring diaphragm. The device functions in a cryogenic environment without the need of heaters to keep the sensor at constant temperatures.

NASA



N95-27191*# National Aeronautics and Space Administration. Langley Research Center, Hampton, VA.

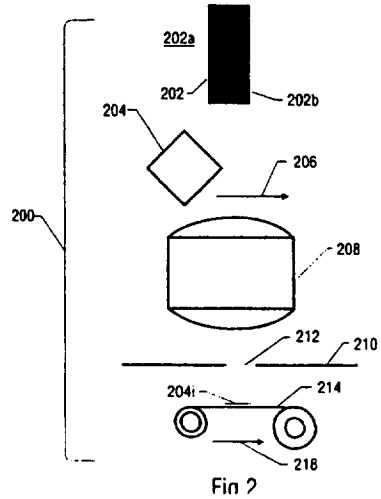
SCHLIEREN SYSTEM AND METHOD FOR MOVING OBJECTS Patent Application

LEONARD M. WEINSTEIN, inventor (to NASA) 14 Feb. 1995 14 p

(NASA-CASE-LAR-15053-1; NAS 1.71:LAR-15053-1; US-PATENT-APPL-SN-388652) Avail: CASI HC A03/MF A01

A system and method are provided for recording density changes in a flow field surrounding a moving object. A mask having an aperture for regulating the passage of images is placed in front of an image recording medium. An optical system is placed in front of the mask. A transition having a light field-of-view and a dark field-of-view is located beyond the test object. The optical system focuses an image of the transition at the mask such that the aperture causes a band of light to be defined on the image recording medium. The optical system further focuses an image of the object through the aperture of the mask so that the image of the object appears on the image recording medium. Relative motion is minimized between the mask and the transition. Relative motion is also minimized between the image recording medium and the image of the object. In this way, the image of the object and density changes in a flow field surrounding the object are recorded on the image recording medium when the object crosses the transition in front of the optical system.

NASA

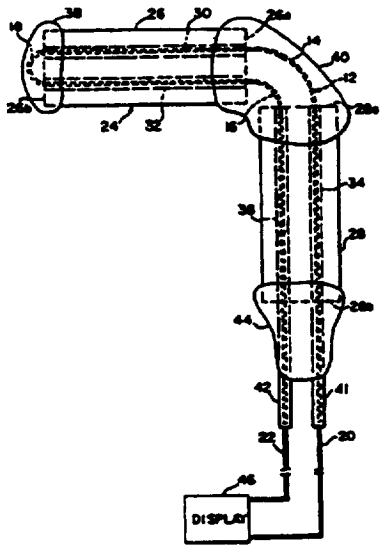


Fin 2

N95-28345* National Aeronautics and Space Administration. Ames Research Center, Moffett Field, CA.
METHOD AND APPARATUS FOR MEASURING TEMPERATURES IN FABRICS AND FLEXIBLE THERMAL INSULATIONS Patent
DEMETRIUS A. KOURTIDES, inventor (to NASA) 21 Mar. 1995 4 p Filed 26 Jul. 1993
(NASA-CASE-ARC-11984-1; US-PATENT-5,399,019; US-PATENT-APPL-SN-096540; US-PATENT-CLASS-374-208; US-PATENT-CLASS-374-179; US-PATENT-CLASS-136-230; US-PATENT-CLASS-136-233; INT-PATENT-CLASS-G01K-1/14; INT-PATENT-CLASS-G01K-1/10; INT-PATENT-CLASS-G01K-1/12) Avail: US Patent and Trademark Office

A temperature sensor uses a type R thermocouple wire element in a ceramic sheath to sense temperatures up to 3,200 deg F., and is particularly suitable for flexible insulations. The sensor includes a thermocouple wire embedded in a sheath having two sections disposed at right angles to each other. The junction of the thermocouple is located at one end of one of the sections and the lead wires extend from the other section. The section which includes the junction is secured to a flexible surface with ceramic cement.

Official Gazette of the U.S. Patent and Trademark Office



N95-28362* National Aeronautics and Space Administration. John F. Kennedy Space Center, Cocoa Beach, FL.
PARTICLE FALLOUT/ACTIVITY SENSOR Patent
IHLEFELD M. CURTIS, inventor (to NASA), ROBERT C. YOUNGQUIST, inventor (to NASA), JOHN S. MOERK, inventor (to NASA), and KENNETH A. ROSE, III, inventor (to NASA) 2 May 1995 11 p Filed 26 Apr. 1994
(NASA-CASE-KSC-11687-1; US-PATENT-5,412,221; US-PATENT-APPL-SN-233584; US-PATENT-CLASS-250-573; US-PATENT-CLASS-356-338; INT-PATENT-CLASS-G01N-15/06) Avail: US Patent and Trademark Office

A particle fallout/activity sensor measures relative amounts of dust or other particles which collect on a mirror in an area to be monitored. The sensor includes a sensor module and a data acquisition module, both of which can be operated independently of one another or in combination with one another. The sensor module includes a housing containing the mirror, an LED assembly for illuminating the mirror and an optical detector assembly for detecting light scattered off of the mirror by dust or other particles collected thereon. A microprocessor controls operation of the sensor module's components and displays results of a measurement on an LCD display mounted on the housing. A push button switch is also mounted on the housing which permits manual initiation of a measurement. The housing is constructed of light absorbing material, such as black delrin, which minimizes detection of light by the optical detector assembly other than that scattered by dust or particles on the mirror. The data acquisition module can be connected to the sensor module and includes its own microprocessor, a timekeeper and other digital circuitry for causing the sensor module to make a measurement periodically and send the measurement data to the data acquisition module for display and storage in memory for later retrieval and transfer to a separate computer. The time tagged measurement data can also be used to determine the relative level of activity in the monitored area since this level is directly related to the amount of dust or particle fallout in the area.

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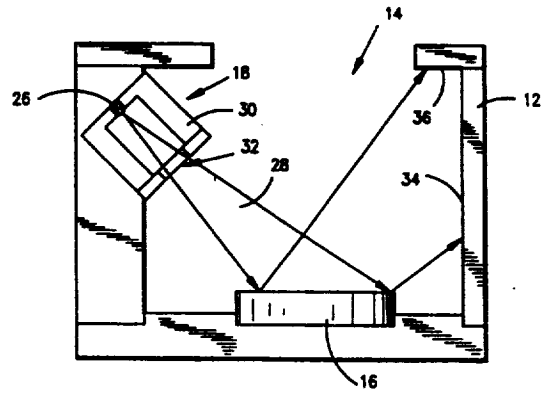


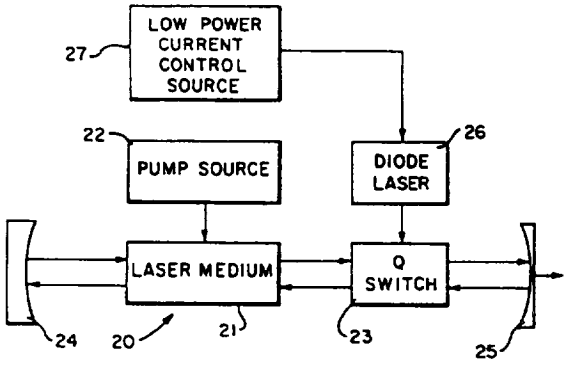
36
LASERS AND MASERS

Includes parametric amplifiers.

N95-27731* National Aeronautics and Space Administration. Pasadena Office, CA.
LASER WITH OPTICALLY DRIVEN Q-SWITCH Patent
HAMID HEMMATI, inventor (to NASA) (Jet Propulsion Lab., California Inst. of Tech., Pasadena, CA.) 18 Apr. 1995 5 p Filed 15 Jul. 1993 Supersedes N94-15932 (32 - 3, p 1038)
(Contract(s)/Grant(s): NAS7-918)
(NASA-CASE-NPO-18470-1-CU; US-PATENT-5,408,480; US-PATENT-APPL-SN-094332; US-PATENT-CLASS-372-10; US-PATENT-CLASS-372-11; INT-PATENT-CLASS-H01S-3/11) Avail: US Patent and Trademark Office

An optically driven interactive Q-switch, i.e., a Q-switch that responds to a short pulse of light, for example, from external light-emitting diodes (LED's) or diode lasers, is provided for producing an output laser pulse from electronic energy stored in a laser medium. Q-switching is thus achieved on demand by electrically pulsing the light source to produce a pulse of light directed onto a Q-switch medium in the laser cavity. Electronic control of the light pulse from the external source will thus provide not only efficient Q-switching frequency but also independent control of output laser pulse width

with a fast rise time for each output laser pulse.
Official Gazette of the U.S. Patent and Trademark Office



37
MECHANICAL ENGINEERING

Includes auxiliary systems (nonpower); machine elements and processes; and mechanical equipment.

N95-22543*# National Aeronautics and Space Administration. Pasadena Office, CA.
CONTROLLING UNDER-ACTUATED ROBOT ARMS USING A HIGH SPEED DYNAMICS PROCESS Patent
ABHINANDAN JAIN, inventor (to NASA) (Jet Propulsion Lab., California Inst. of Tech., Pasadena, CA.) and GUILLERMO RODRIGUEZ, inventor (to NASA) (Jet Propulsion Lab., California Inst. of Tech., Pasadena, CA.) 27 Dec. 1994 25 p Filed 3 Apr. 1992 Supersedes N92-24043 (30 - 14, p 2385
(Contract(s)/Grant(s): NAS7-918)
(NASA-CASE-NPO-18498-1-CU; US-PATENT-5,377,310; US-PATENT-APPL-SN-866779; US-PATENT-CLASS-395-95; US-PATENT-CLASS-395-97; US-PATENT-CLASS-395-98; INT-PATENT-CLASS-G06F-15/00) Avail: US Patent and Trademark Office

The invention controls an under-actuated manipulator by first obtaining predetermined active joint accelerations of the active joints and the passive joint friction forces of the passive joints, then computing articulated body qualities for each of the joints from the current positions of the links, and finally computing from the articulated body qualities and from the active joint accelerations and the passive joint forces, active joint forces of the active joints. Ultimately, the invention transmits servo commands to the active joint forces thus computed to the respective ones of the joint servos. The computation of the active joint forces is accomplished using a recursive dynamics algorithm. In this computation, an inward recursion is first carried out for each link, beginning with the outermost link in order to compute the residual link force of each link from the active joint acceleration if the corresponding joint is active, or from the known passive joint force if the corresponding joint is passive. Then, an outward recursion is carried out for each link in which the active joint force is computed from the residual link force if the corresponding joint is active or the passive joint acceleration is computed from the residual link force if the corresponding joint is passive.
Official Gazette of the U.S. Patent and Trademark Office

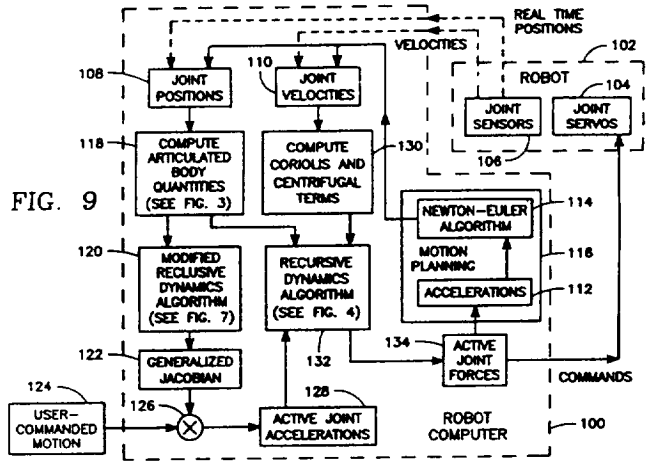


FIG. 9

N95-22892*# National Aeronautics and Space Administration. Lyndon B. Johnson Space Center, Houston, TX.
PRESSURIZED FLUID TORQUE DRIVER CONTROL AND METHOD Patent Application
JOSEPH S. COOK, JR., inventor (to NASA) 10 Aug. 1994 45 p (NASA-CASE-MSC-22385-1; NAS 1.17:MSC-22385-1; US-PATENT-APPL-SN-288114) Avail: CASI HC A03/MF A01

Methods and apparatus are provided for a torque driver including a displaceable gear to limit torque transfer to a fastener at a precisely controlled torque limit. A biasing assembly biases a first gear into engagement with a second gear for torque transfer between the first and second gear. The biasing assembly includes a pressurized cylinder controlled at a constant pressure that corresponds to a torque limit. A calibrated gage and valve is used to set the desired torque limit. One or more coiled output linkages connect the first gear with the fastener adaptor which may be a socket for a nut. A gear tooth profile provides a separation force that overcomes the bias to limit torque at the desired torque limit. Multiple fasteners may be rotated simultaneously to a desired torque limit if additional output spur gears are provided. The torque limit is adjustable and may be different for fasteners within the same fastener configuration.

NASA

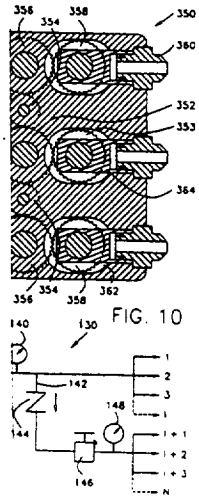


FIG. 10

N95-23376* National Aeronautics and Space Administration. Ames Research Center, Moffett Field, CA.

QUICK CONNECT COUPLING Patent

CURTIS LOMAX, inventor (to NASA) and BRUCE WEBBON, inventor (to NASA) 28 Feb. 1995 11 p Filed 16 Aug. 1993 Division of US-Patent-Appl-SN-703649, filed 21 May 1991, US-Patent-5,261,482

(NASA-CASE-ARC-11921-2; US-PATENT-5,392,844; US-PATENT-APPL-SN-106865; US-PATENT-APPL-SN-703649; US-PATENT-CLASS-165-10; US-PATENT-CLASS-62-250.3; US-PATENT-CLASS-62-299; US-PATENT-CLASS-137-614.04; US-PATENT-CLASS-165-104.17; INT-PATENT-CLASS-F28D-17/00) Avail: US Patent and Trademark Office

A cooling apparatus includes a container filled with a quantity of coolant fluid initially cooled to a solid phase, a cooling loop disposed between a heat load and the container, a pump for circulating a quantity of the same type of coolant fluid in a liquid phase through the cooling loop, and a pair of couplings for communicating the liquid phase coolant fluid into the container in a direct interface with the solid phase coolant fluid.

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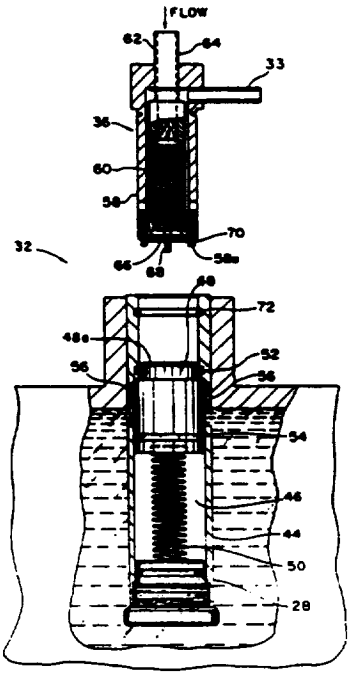

N95-25548* National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, AL.

TERNARY GAS PLASMA WELDING TORCH Patent

DANIEL J. RYBICKI, inventor (to NASA) (Martin Marietta Corp., Huntsville, AL.), WILLIAM F. MCGEE, inventor (to NASA) (Martin Marietta Corp., Huntsville, AL.), and DOUGLAS J. WALDRON, inventor (to NASA) (Palmdale, CA. Waldron, Douglas J.,) 21 Mar. 1995 5 p Filed 27 Dec. 1993 Supersedes N94-30173 (32 - 8, p 3303)

(NASA-CASE-MFS-28857-1; US-PATENT-5,399,831; US-PATENT-APPL-SN-172961; US-PATENT-CLASS-219-121.45; US-PATENT-CLASS-219-121.5; US-PATENT-CLASS-219-121.51; US-PATENT-CLASS-219-121.48; INT-PATENT-CLASS-B23K-10/00) Avail: US Patent and Trademark Office

A plasma arc welding torch is discussed. A first plasma gas is directed through the body of the welding torch and out of the body across the tip of a welding electrode disposed at the forward end of the body. A second plasma gas is disposed for flow through a longitudinal bore in the electrode. The second plasma gas enters one end of the electrode and exits the electrode at the tip thereof for co-acting with the electric welding arc to produce the desired weld. A shield gas is directed through the torch body and circulates around the head of the torch adjacent to the electrode tip.

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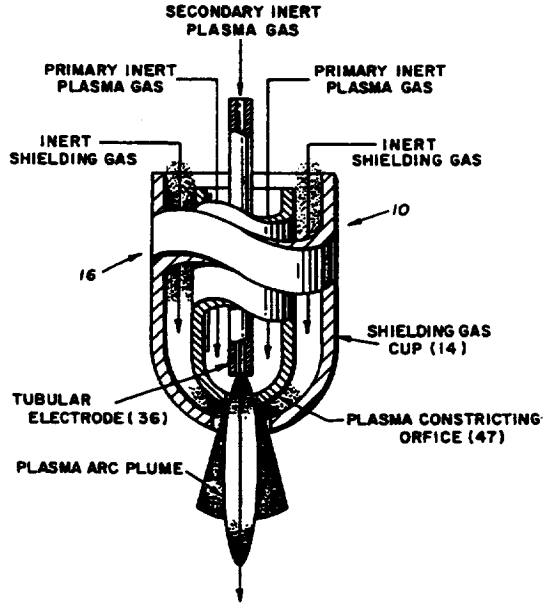

N95-25592* National Aeronautics and Space Administration. Lyndon B. Johnson Space Center, Houston, TX.

PRELOAD RELEASE MECHANISM Patent

ROBERT M. GENEROLI, inventor (to NASA) (McDonnell-Douglas Corp., Houston, TX.) and HARRY J. YOUNG, inventor (to NASA) (McDonnell-Douglas Corp., Houston, TX.) 14 Mar. 1995 10p Filed 20 Apr. 1994 Supersedes N94-36839 (32 - 12, p 4450)

(NASA-CASE-MSC-22327-1; US-PATENT-5,397,244; US-PATENT-APPL-SN-230571; US-PATENT-CLASS-439-248; INT-PATENT-CLASS-H01R-13/629) Avail: US Patent and Trademark Office

This invention relates to a preload release mechanism comprising a preload spring assembly adapted to apply a preload to a first connector member which is mounted on a support structure and adapted for connection with a second connector member on an object. The assembly comprises telescoped bushings and a preload spring. A tubular shaft extends through the spring assembly and openings in the first connector member and support structure, on which it is clamped. A plunger rod in the shaft is provided with a tip end and a recess in the rod near the other end thereof. A retainer precludes passage of the rod through the shaft in one direction and an end cap closes the bore of the shaft at the other end and provides a shoulder which extends radially of the shaft. A plunger return spring biases the plunger rod against the plunger retainer with the plunger tip protruding from the shaft and a spring assembly return spring engages at its ends the shoulder of the end cap and one end of the spring assembly. Detents received in lateral openings in the tubular shaft are held captive by the plunger rod and one end of the spring assembly to lock the spring assembly on the tubular shaft and

apply a preload to the first connector member. Upon completion of the connection, detents and spring assembly are released by plunger contact with the object to be connected, thereby releasing the preload while the connection is maintained.

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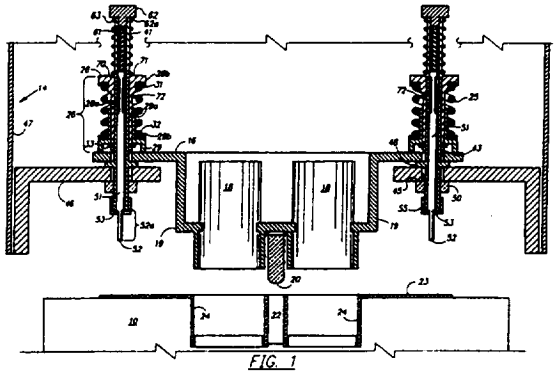

FIG. 1

N95-28256* National Aeronautics and Space Administration. Ames Research Center, Moffett Field, CA.

COOLING APPARATUS AND COUPLINGS THEREFOR Patent

CURTIS LOMAX, inventor (to NASA) and BRUCE WEBBON, inventor (to NASA) 16 Nov. 1993 11 p Filed 21 May 1991

(NASA-CASE-ARC-11921-1; US-PATENT-5,261,482; US-PATENT-APPL-SN-703649; US-PATENT-CLASS-165-10; US-PATENT-CLASS-165-104.17; US-PATENT-CLASS-165-78; US-PATENT-CLASS-62-59; US-PATENT-CLASS-62-259.3; US-PATENT-CLASS-62-299; INT-PATENT-CLASS-F28D-20/00) Avail: US Patent and Trademark Office

A cooling apparatus includes a container filled with a quantity of coolant fluid initially cooled to a solid phase, a cooling loop disposed between a heat load and the container. A pump for circulating a quantity of the same type of coolant fluid in a liquid phase through the cooling loop, a pair of couplings for communicating the liquid phase coolant fluid into the container in a direct interface with the solid phase coolant fluid.

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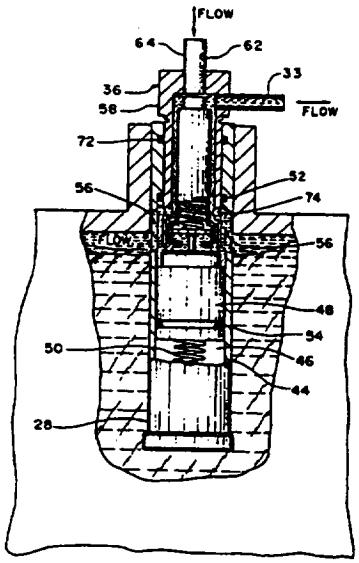

N95-28347* National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, AL.

APPARATUS FOR TESTING HIGH PRESSURE INJECTOR ELEMENTS Patent

WILLIAM NEILL MYERS, inventor (to NASA), EWELL M. SCOTT, inventor (to NASA), JOHN C. FORBES, inventor (to NASA), and MICHAEL D. SHADOAN, inventor (to NASA) 9 May 1995 19 p Filed 7 Sep. 1993

(NASA-CASE-MFS-28773-1; US-PATENT-5,412,981; US-PATENT-APPL-SN-117587; US-PATENT-CLASS-73-119; US-PATENT-CLASS-359-509; INT-PATENT-CLASS-G01M-15/00; INT-PATENT-CLASS-F02M-65/00) Avail: US Patent and Trademark Office

An apparatus for testing and evaluating the spray pattern of high pressure fuel injector elements for use in supplying fuel to combustion engines is presented. Prior art fuel injector elements were normally tested by use of low pressure apparatuses which did not provide a purge to prevent mist from obscuring the injector element or to prevent frosting of the view windows; could utilize only one fluid during each test; and had their viewing ports positioned one hundred eighty (180 deg) apart, thus preventing optimum use of laser diagnostics. The high pressure fluid injector test apparatus includes an upper hub, an upper weldment or housing, a first clamp and stud/nut assembly for securing the upper hub to the upper weldment, a standoff assembly within the upper weldment, a pair of window housings having view glasses within the upper weldment, an injector block assembly and purge plate within the upper weldment for holding an injector element to be tested and evaluated, a lower weldment or housing, a second clamp and stud/nut assembly for securing the lower weldment to the upper hub, a third clamp and stud/nut assembly for securing the lower hub to the lower weldment, mechanisms for introducing fluid under high pressure for testing an injector element, and mechanisms for purging the apparatus to prevent frosting of view glasses within the window housings and to permit unobstructed viewing of the injector element.

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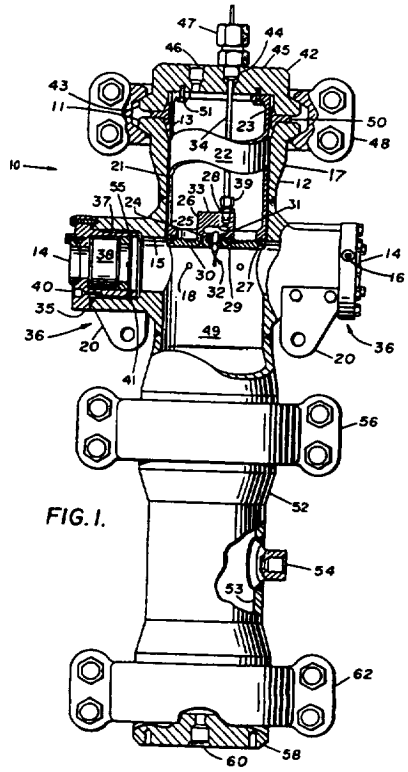

FIG. 1.

N95-28359* National Aeronautics and Space Administration. John F. Kennedy Space Center, Cocoa Beach, FL.
WATER DRIVEN TURBINE/BRUSH PIPE CLEANER Patent
RUDY J. WERLINK, inventor (to NASA) 18 Apr. 1995 8 p Filed 7 Mar. 1994
(NASA-CASE-KSC-11669-1; US-PATENT-5,406,666; US-PATENT-APPL-SN-207313; US-PATENT-CLASS-15-104.12; US-PATENT-CLASS-15-104.31; INT-PATENT-CLASS-B08B-9/02) Avail: US Patent and Trademark Office

Assemblies are disclosed for cleaning the inside walls of pipes and tubes. A first embodiment includes a small turbine with angled blades axially mounted on one end of a standoff support. An O-ring for stabilizing the assembly within the pipe is mounted in a groove within the outer ring. A replaceable circular brush is fixedly mounted on the opposite end of the standoff support and can be used for cleaning tubes and pipes of various diameters, lengths and configurations. The turbine, standoff support, and brush spin in unison relative to a hub bearing that is fixedly attached to a wire upstream of the assembly. The nonrotating wire is for retaining the assembly in tension and enabling return of the assembly to the pipe entrance. The assembly is initially placed in the pipe or tube to be cleaned. A pressurized water or solution source is provided at a required flow-rate to propel the assembly through the pipe or tube. The upstream water pressure propels and spins the turbine, standoff support and brush. The rotating brush combined with the solution cleans the inside of the pipe. The solution flows out of the other end of the pipe with the brush rotation controlled by the flow-rate. A second embodiment is similar to the first embodiment but instead includes a circular shaped brush with ring backing mounted in the groove of the exterior ring of the turbine, and also reduces the size of the standoff support or eliminates the standoff support.

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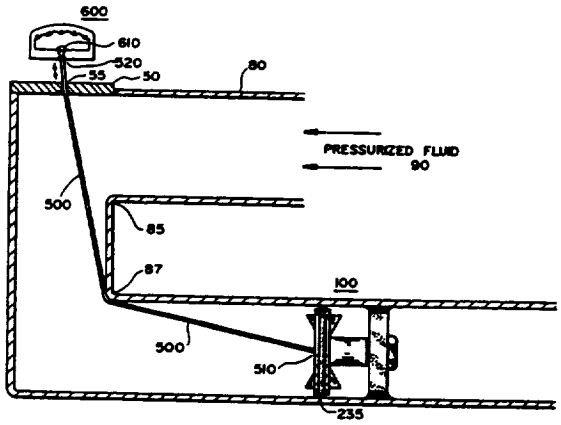

N95-28702* National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, MD.
CARRIER-LESS, ANTI-BACKLASH PLANETARY DRIVE SYSTEM Patent
JOHN M. VRANISH, inventor (to NASA) 25 Apr. 1995 10 p Filed 2 Nov. 1993
(NASA-CASE-GSC-13608-1; US-PATENT-5,409,431; US-PATENT-APPL-SN-147276; US-PATENT-CLASS-475-342; US-PATENT-CLASS-F16H-1/28) Avail: US Patent and Trademark Office

This invention relates to a carrier-less, anti-backlash planetary gear system that has an input sun gear, a force-balancing and planet-alignment 'speeder' gear above the sun gear, a split ring gear that has a fixed lower ring gear coaxial with the sun gear and a rotating upper ring gear also coaxial with the sun gear. A preload bolt is used for securing the split ring gears together. Within the split ring gear is an even number of planet gears between the split ring gear and the sun gear. Each planet gear consists of an upper planet gear, and lower planet gear with the upper and lower planet gears splined together and pushed apart by a spring which causes separation and relative twist between the upper and lower planet gears. The lower planet gear meshes with the input sun gear and the fixed ring gear while the upper planet gear is driven by the lower planet gear and meshes with the rotating ring gear.

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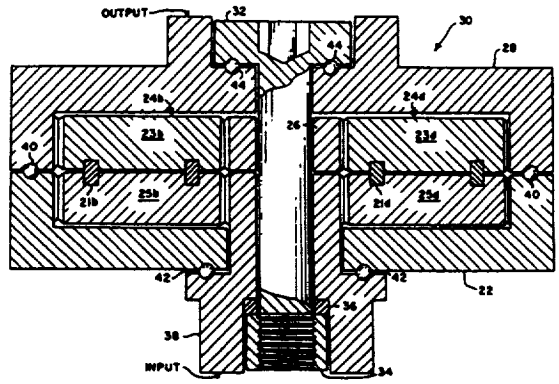

38
QUALITY ASSURANCE AND RELIABILITY

Includes product sampling procedures and techniques; and quality control.

N95-25304* National Aeronautics and Space Administration. Langley Research Center, Hampton, VA.
A QUALITY MONITOR AND MONITORING TECHNIQUE EMPLOYING OPTICALLY STIMULATED ELECTRON EMISSION Patent
WILLIAM T. YOST, inventor (to NASA), CHRISTOPHER S. WELCH, inventor (to NASA) (College of William and Mary, Gloucester Point, VA.), EDMOND J. JOE, inventor (to NASA) (AS&M, Inc., Hampton, VA.), and BILL BRYAN HEFNER, JR., inventor (to NASA) (AS&M, Inc., Hampton, VA.) 28 Feb. 1995 21 p Filed 11 May 1993 Supersedes N93-30414 (31 - 11, p 3449)
(NASA-CASE-LAR-15063-1-CU; US-PATENT-5,393,980; US-PATENT-APPL-SN-060617; US-PATENT-CLASS-250-306; US-PATENT-CLASS-250-305; US-PATENT-CLASS-250-307; US-PATENT-CLASS-250-310; INT-PATENT-CLASS-G01N-23/227) Avail: US Patent and Trademark Office

A light source directs ultraviolet light onto a test surface and a detector detects a current of photoelectrons generated by the light. The detector includes a collector which is positively biased with respect to the test surface. Quality is indicated based on the photoelectron current. The collector is then negatively biased to replace charges removed by the measurement of a nonconducting substrate to permit subsequent measurements. Also, the intensity of the ultraviolet light at a particular wavelength is monitored and the voltage of the light source varied to maintain the light a constant desired intensity. The light source is also cooled via a gas circulation system. If the test surface is an insulator, the surface is bombarded

with ultraviolet light in the presence of an electron field to remove the majority of negative charges from the surface. The test surface is then exposed to an ion field until it possesses no net charge. The technique described above is then performed to assess quality.

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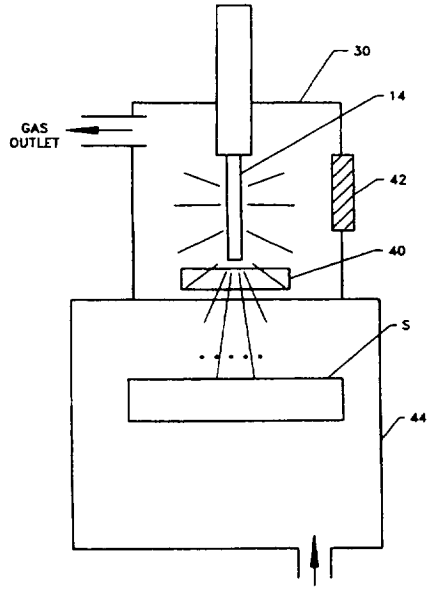

sampled, and the proportion of the sampled area covered by residue or vegetation is calculated.

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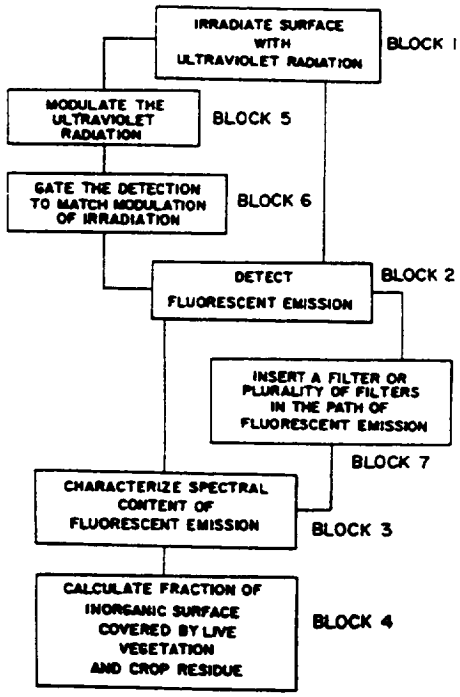


43
EARTH RESOURCES AND REMOTE SENSING

Includes remote sensing of earth resources by aircraft and spacecraft; photogrammetry; and aerial photography.

N95-28211* National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, MD.
METHOD FOR DETERMINING SURFACE COVERAGE BY MATERIALS EXHIBITING DIFFERENT FLUORESCENT PROPERTIES Patent
EMMETT W. CHAPPELLE, inventor (to NASA), CRAIG S. T. DAUGHTRY, inventor (to NASA), and JAMES E. MCMURTREY, III, inventor (to NASA) 2 May 1995 9 p Filed 22 Nov. 1993
(NASA-CASE-GSC-13539-1; US-PATENT-5,412,219; US-PATENT-APPL-SN-155605; US-PATENT-CLASS-250-461.1; US-PATENT-CLASS-250-253; INT-PATENT-CLASS-G01N-21/64) Avail: US Patent and Trademark Office

An improved method for detecting, measuring, and distinguishing crop residue, live vegetation, and mineral soil is presented. By measuring fluorescence in multiple bands, live and dead vegetation are distinguished. The surface of the ground is illuminated with ultraviolet radiation, inducing fluorescence in certain molecules. The emitted fluorescent emission induced by the ultraviolet radiation is measured by means of a fluorescence detector, consisting of a photodetector or video camera and filters. The spectral content of the emitted fluorescent emission is characterized at each point

52
AEROSPACE MEDICINE

Includes physiological factors; biological effects of radiation; and effects of weightlessness on man and animals.

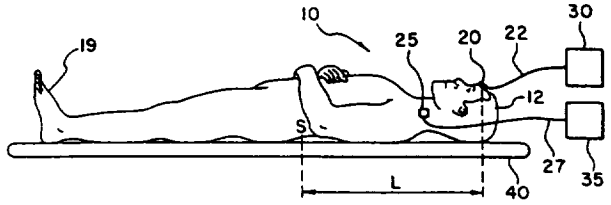
N95-26889*# National Aeronautics and Space Administration. Langley Research Center, Hampton, VA.
NON-INVASIVE METHOD AND APPARATUS FOR MONITORING INTRACRANIAL PRESSURE AND PRESSURE VOLUME INDEX IN HUMANS Patent Application
JOHN H. CANTRELL, inventor (to NASA) and WILLIAM T. YOST, inventor (to NASA) 24 Aug. 1994 30 p
(NASA-CASE-LAR-13894-1; NAS 1.71:LAR-13894-1; US-PATENT-APPL-SN-297474) Avail: CASI HC A03/MF A01

Non-invasive measuring devices responsive to changes in a patient's intracranial pressure (ICP) can be accurately calibrated for monitoring purposes by providing known changes in ICP by non-invasive methods, such as placing the patient on a tilting bed and calculating a change in ICP from the tilt angle and the length of the patient's cerebrospinal column, or by placing a pressurized skull cap on the patient and measuring the inflation pressure. Absolute values for the patient's pressure-volume index (PVI) and the steady state ICP can then be determined by inducing two known changes in the volume of cerebrospinal fluid while recording the corresponding changes in ICP by means of the calibrated measuring device. The

two pairs of data for pressure change and volume change are entered into an equation developed from an equation describing the relationship between ICP and cerebrospinal fluid volume. PVI and steady state ICP are then determined by solving the equation. Methods for inducing known changes in cerebrospinal fluid volume are described.

NASA

FIG. IA



53
BEHAVIORAL SCIENCES

Includes psychological factors; individual and group behavior; crew training and evaluation; and psychiatric research.

N95-22579* National Aeronautics and Space Administration. Langley Research Center, Hampton, VA.
METHOD OF ENCOURAGING ATTENTION BY CORRELATING VIDEO GAME DIFFICULTY WITH ATTENTION LEVEL Patent
ALAN T. POPE, inventor (to NASA) and EDWARD H. BOGART, inventor (to NASA) (Lockheed Engineering and Sciences Co., Hampton, VA.) 27 Dec. 1994 13 p Filed 8 Mar. 1993 Supersedes N93-28128 (31 - 10, p 3085)
(NASA-CASE-LAR-15022-1; US-PATENT-5,377,100; US-PATENT-APPL-SN-029808; US-PATENT-CLASS-364-410; INT-PATENT-CLASS-G06F-15/44) Avail: US Patent and Trademark Office

A method of encouraging attention in persons such as those suffering from Attention Deficit Disorder is provided by correlating the level of difficulty of a video game with the level of attention in a subject. A conventional video game comprises a video display which depicts objects for interaction with a player and a difficulty adjuster which increases the difficulty level, e.g., action speed and/or evasiveness of the depicted object, in a predetermined manner. The electrical activity of the brain is measured at selected sites to determine levels of awareness, e.g., activity in the beta, theta, and alpha states. A value is generated based on this measured electrical signal which is indicative of the level of awareness. The difficulty level of the game is increased as the awareness level value decreases and is decreased as this awareness level value increases

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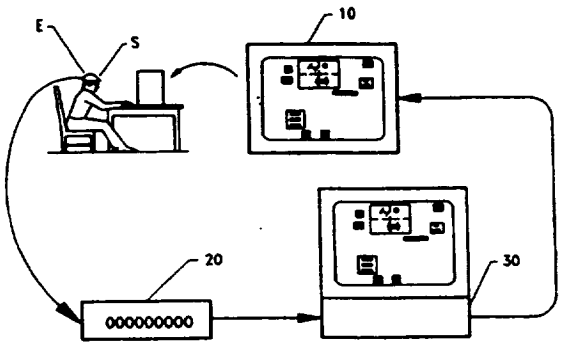

54
MAN/SYSTEM TECHNOLOGY AND LIFE SUPPORT

Includes human engineering; biotechnology; and space suits and protective clothing.

N95-22766* National Aeronautics and Space Administration. Lyndon B. Johnson Space Center, Houston, TX.
METHOD FOR FORMING A GLOVE ATTACHMENT Patent
FREDERIC S. DAWN, inventor (to NASA), WALTER W. GUY, inventor (to NASA), JOSEPH KOSMO, inventor (to NASA), ARTHUR P. DRENNAN, inventor (to NASA), and RICHARD P. TSCHIRCH, inventor (to NASA) 24 Jan. 1995 6 p Filed 14 Aug. 1992 Supersedes N92-34210 (30 - 24, p 4222)
(NASA-CASE-MSC-21632-1; US-PATENT-5,384,083; US-PATENT-APPL-SN-929556; US-PATENT-CLASS-264-130; US-PATENT-CLASS-264-135; US-PATENT-CLASS-264-137; US-PATENT-CLASS-264-257; INT-PATENT-CLASS-B29C-39/12; INT-PATENT-CLASS-B29C-67/14) Avail: US Patent and Trademark Office

An attachment principally for the palm of an astronaut glove to enhance the gripping area of the palm without detracting from the flexibility and utility of the glove is presented. The attachment is a composite construction formed from a layer of silicone rubber having an outer surface with a friction configuration and another layer of silicone rubber in which a Nomex Aramid mesh fabric is embedded prior to curing. The method of construction involves the use of a mold with a friction configuration surface. A first layer of silicone rubber or sealant is disposed in the mold and allowed to set for an hour. A second layer of silicone rubber or sealant is layered over the first layer and leveled. A Nomex Aramid mesh fabric is embedded into the second layer and the composite is permitted to cure. When cured, a configured area of the composite construction is glued or stitched to the palm area of the glove.

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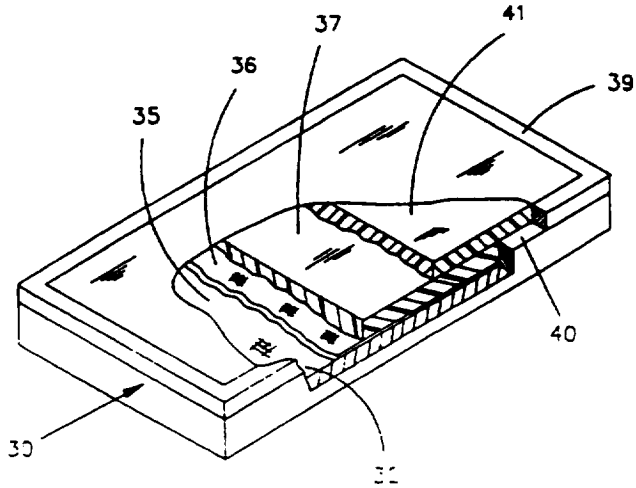

N95-23264* National Aeronautics and Space Administration. Ames Research Center, Moffett Field, CA.
SELF-GENERATING OSCILLATING PRESSURE EXERCISE DEVICE Patent
DONALD E. WATENPAUGH, inventor (to NASA) 18 Oct. 1994 8 p Filed 13 May 1993
(NASA-CASE-ARC-12000-1; US-PATENT-5,356,361; US-PATENT-APPL-SN-061401; US-PATENT-CLASS-482-111; US-PATENT-CLASS-601-23; INT-PATENT-CLASS-A63B-21/008) Avail: US Patent and Trademark Office

An exercise device, especially suitable for zero gravity workouts, has a collapsible chamber which generates negative pressure on the lower portion of a body situated therein. The negative pressure is generated by virtue of leg, hand and shoulder interaction which contracts and expands the chamber about the person and by virtue of air flow regulation by valve action.

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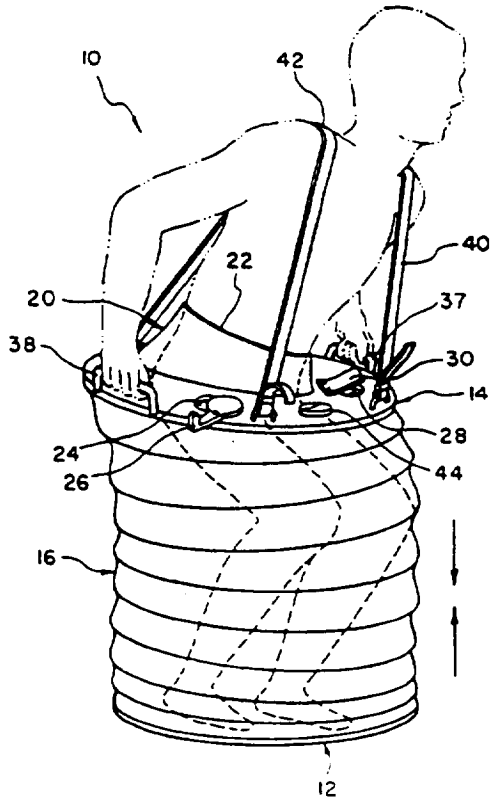

N95-25306* National Aeronautics and Space Administration. Lyndon B. Johnson Space Center, Houston, TX.
INFLATABLE RESCUE DEVICE Patent
SCOTT A. SWAN, inventor (to NASA) 28 Mar. 1995 9 p Filed 4 May 1993 Supersedes N94-15883 (32 - 3, p 1137)
(NASA-CASE-MSC-22244-1; US-PATENT-5,401,069; US-PATENT-APPL-SN-066274; US-PATENT-CLASS-294-1.1; US-PATENT-CLASS-294-19.1; US-PATENT-CLASS-244-158R; INT-PATENT-CLASS-B25J-1/00) Avail: US Patent and Trademark Office

This invention discloses, in one aspect, a personal rescue device for use in outer space which has an inflatable flexible tube with a shaper apparatus herein. Gas under pressure flows through the shaper apparatus and into the flexible tube. The flexible tube is mounted to the shaper so that as it inflates it expands and deploys lengthwise away from the shaper. In one embodiment a housing contains the shaper and the flexible tube and the housing is designed to facilitate movement of the expanding tube from the housing so the expanding tube does not bunch up in the housing.

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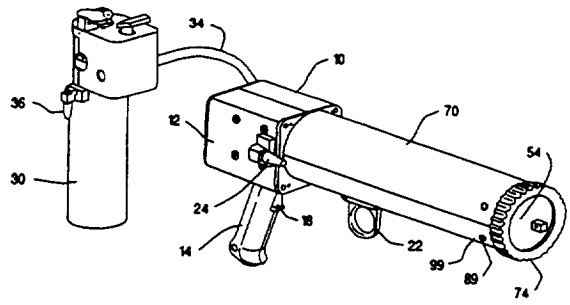
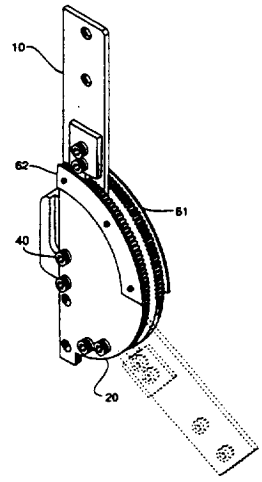


N95-27501*# National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, AL.
AUTOMATIC LOCKING KNEE BRACE JOINT Patent Application
BRUCE WEDDENDORF, inventor (to NASA) 17 Apr. 1995 17 p
(NASA-CASE-MFS-28997-1; NAS 1.71:MFS-28997-1; US-PATENT-APPL-SN-422961) Avail: CASI HC A03/MF A01

This invention is an apparatus for controlling the pivotal movement of a knee brace comprising a tang-and-clevis joint that has been uniquely modified. Both the tang and the clevis have a set of teeth that, when engaged, can lock the tang and the clevis together. In addition, the tang is biased away from the clevis. Consequently, when there is no axial force (i.e., body weight) on the tang, the tang is free to pivot within the clevis. However, when an axial force is exerted on the tang, the tang is pushed into the clevis, both sets of teeth engage, and the tang and the clevis lock together.

NASA



61
COMPUTER PROGRAMMING AND SOFTWARE

Includes computer programs, routines, and algorithms, and specific applications, e.g., CAD/CAM.

N95-22577* National Aeronautics and Space Administration. Pasadena Office, CA.

MAPPINGS BETWEEN CODEWORDS OF TWO DISTINCT (N,K) REED-SOLOMON CODES OVER GF(2(SUP J)) Patent

MARVIN PERLMAN, inventor (to NASA) (Jet Propulsion Lab., California Inst. of Tech., Pasadena, CA.) 27 Dec. 1994 32 p Filed 3 Sep. 1992 Supersedes N93-11664 (31 - 2, p 412)
(Contract(s)/Grant(s): NAS7-918)
(NASA-CASE-NPO-18771-1-CU; US-PATENT-5,377,207; US-PATENT-APPL-SN-942500; US-PATENT-CLASS-371-37.1; INT-PATENT-CLASS-G06F-11/10; INT-PATENT-CLASS-H03M-13/00)
Avail: US Patent and Trademark Office

A process for realizing mappings between code-words of two distinct (N,K) Reed-Solomon (RS) codes over GF(2 sup J) having selected two independent parameters: J, specifying the number of bits per symbol; and E, the symbol error correction capability of the code, wherein said independent parameters J and E yield the following: N = 2(sup J)-1 total number of symbols per codeword; 2E, the number of symbols assigned a role of check symbols; and K = N-2E, the number of code symbols representing information, all within a codeword of an (N,K) RS code over GF(2 sup J), and having selected said parameters for encoding, the implementation of a decoder is governed by: 2(sup J) field elements defined by a degree J primitive polynomial over GF(2) denoted by F(x); a code generator polynomial of degree 2E containing 2E consecutive roots of a primitive element defined by F(x); and, in a Berlekamp RS code, the basis in which the RS information and check symbols are represented. The process includes separate transformation steps for symbol-by-symbol conversion for a first RS code to ultimately a second conventional RS code capable of being corrected by a conventional RS decoder, followed by a reverse sequence of the inverse of the first set of steps to arrive at codewords having connected information symbols, at which time check symbols of the RS code may be discarded.

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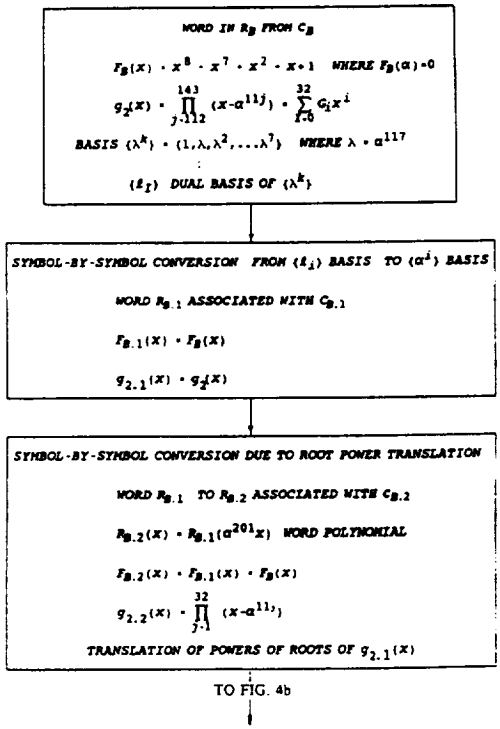

62
COMPUTER SYSTEMS

Includes computer networks and special application computer systems.

N95-22564* National Aeronautics and Space Administration. Pasadena Office, CA.

NON-BLOCKING CROSSBAR PERMUTATION ENGINE WITH CONSTANT ROUTING LATENCY Patent

STEVE P. MONACOS, inventor (to NASA) (Jet Propulsion Lab., California Inst. of Tech., Pasadena, CA.) 27 Dec. 1994 30 p Filed 18 Aug. 1993 Supersedes N94-17328 (32 - 3, p 1161)
(Contract(s)/Grant(s): NAS7-918)
(NASA-CASE-NPO-18864-1-CU; US-PATENT-5,377,182; US-PATENT-APPL-SN-111318; US-PATENT-CLASS-370-16; US-PATENT-CLASS-370-58.3; US-PATENT-CLASS-370-60; US-PATENT-CLASS-370-94.1; US-PATENT-CLASS-340-827; US-PATENT-CLASS-340-825.8; US-PATENT-CLASS-379-221)
Avail: US Patent and Trademark Office

The invention is embodied in an N x N crossbar for routing packets from a set of N input ports to a set of N output ports, each packet having a header identifying one of the output ports as its destination, including a plurality of individual links which carry individual packets. Each link has a link input end and a link output end, a plurality of switches. Each of the switches has at least top and bottom switch inputs connected to a corresponding pair of the link output ends and top and bottom switch outputs connected to a corresponding pair of link input ends, whereby each switch is connected to four different links. Each of the switches has an exchange state which routes packets from the top and bottom switch inputs to the bottom and top switch outputs, respectively, and a bypass state which routes packets from the top and bottom switch inputs to the top and bottom switch outputs, respectively. A plurality of individual controller devices governing respective switches for sensing from a header of a packet at each switch input for the identity of the destination output port of the packet and selecting one of the exchange and bypass states in accordance with the identity of the destination output port and with the location of the corresponding switch relative to the destination output port.

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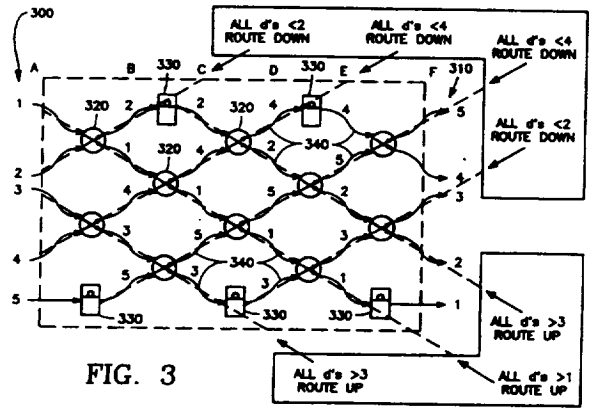

FIG. 3

63
CYBERNETICS

Includes feedback and control theory, artificial intelligence, robotics and expert systems.

N95-23387* National Aeronautics and Space Administration. Ames Research Center, Moffett Field, CA.
METHOD AND SYSTEM FOR PATTERN ANALYSIS USING A COARSE-CODED NEURAL NETWORK Patent
LILJANA SPIRKOVSKA, inventor (to NASA) and MAX B. REID, inventor (to NASA) 26 Jul. 1994 20 p Filed 2 Jul. 1992
(NASA-CASE-ARC-11961-1; US-PATENT-5,333,210; US-PATENT-APPL-SN-908141; US-PATENT-CLASS-382-15; US-PATENT-CLASS-382-27; INT-PATENT-CLASS-G06K-9/46) Avail: US Patent and Trademark Office

A method and system for performing pattern analysis with a neural network coarse-coding a pattern to be analyzed so as to form a plurality of sub-patterns collectively defined by data. Each of the sub-patterns comprises sets of pattern data. The neural network includes a plurality fields, each field being associated with one of the sub-patterns so as to receive the sub-pattern data therefrom. Training and testing by the neural network then proceeds in the usual way, with one modification: the transfer function thresholds the value obtained from summing the weighted products of each field over all sub-patterns associated with each pattern being analyzed by the system.

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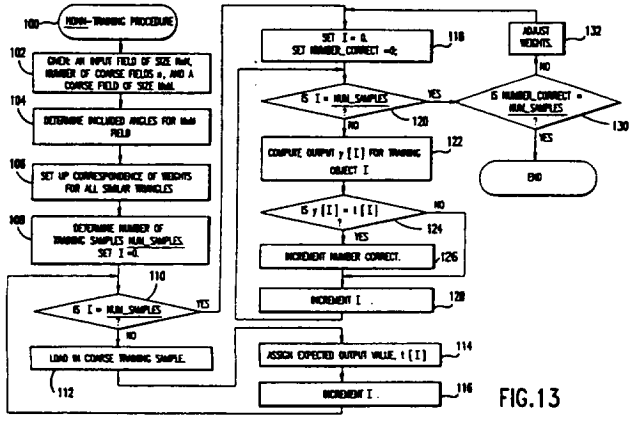


FIG.13

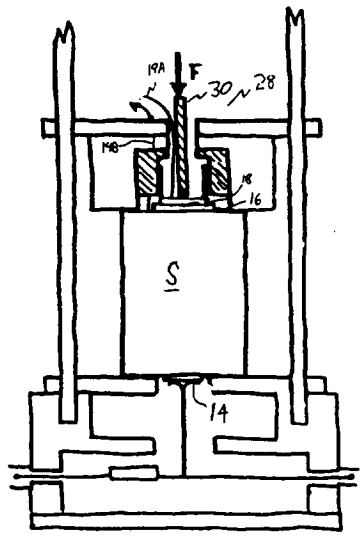
71
ACOUSTICS

Includes sound generation, transmission, and attenuation.

N95-22921*# National Aeronautics and Space Administration. Langley Research Center, Hampton, VA.
CAPACITIVE ACOUSTIC WAVE DETECTOR AND METHOD OF USING SAME Patent Application
WILLIAM T. YOST, inventor (to NASA) 27 Sep. 1994 18 p
(NASA-CASE-LAR-13890-1; NAS1.71:LAR-13890-1; US-PATENT-APPL-SN-317491) Avail: CASI HC A03/MF A01

A capacitor having two substantially parallel conductive faces is acoustically coupled to a conductive sample end such that the sample face is one end of the capacitor. A non-contacting dielectric may serve as a spacer between the two conductive plates. The formed capacitor is connected to an LC oscillator circuit such as a Hartley oscillator circuit producing an output frequency which is a function of the capacitor spacing. This capacitance oscillates as the sample end coating is oscillated by an acoustic wave generated in the sample by a transmitting transducer. The electrical output can serve as an absolute indicator of acoustic wave displacement.

NASA



N95-26187* National Aeronautics and Space Administration. Lewis Research Center, Cleveland, OH.
JET MIXER NOISE SUPPRESSOR USING ACOUSTIC FEEDBACK Patent
EDWARD J. RICE, inventor (to NASA) 28 Feb. 1995 12 p Filed 10 Feb. 1994 Division of US-Patent-5,325,661 (US Patent-Appl-SN-46256, filed 14 Apr. 1993)
(NASA-CASE-LEW-15170-2; US-PATENT-5,392,597; US-PATENT-APPL-SN-194654; US-PATENT-APPL-SN-046256; US-PATENT-CLASS-60-204; US-PATENT-CLASS-60-271; INT-PATENT-CLASS-F02C-7/00) Avail: US Patent and Trademark Office

The present invention generally relates to providing an improved jet mixer noise suppressor for high speed jets that rapidly mixes high speed air flow with a lower speed air flow, and more particularly, relates to an improved jet mixer noise suppressor that uses feedback of acoustic waves produced by the interaction of shear flow instability waves with an obstacle downstream of the jet nozzle.

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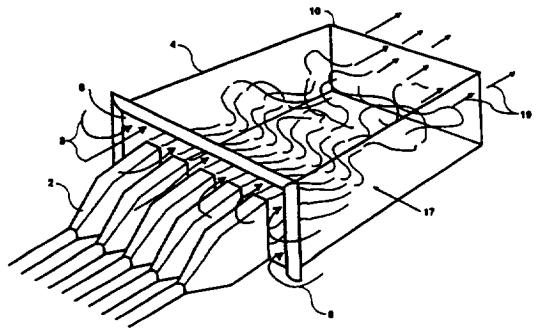

72
ATOMIC AND MOLECULAR PHYSICS

Includes atomic structure, electron properties, and molecular spectra.

N95-28348* National Aeronautics and Space Administration. Pasadena Office, CA.

EXTENDED LINEAR ION TRAP FREQUENCY STANDARD APPARATUS Patent

JOHN D. PRESTAGE, inventor (to NASA) (Jet Propulsion Lab., California Inst. of Tech., Pasadena, CA.) 30 May 1995 42 p Filed 13 May 1994 Prepared in cooperation with Jet Propulsion Lab., California Inst. of Tech., Pasadena, CA

(NASA-CASE-NPO-19081-1-CU; US-PATENT-5,420,549; US-PATENT-APPL-SN-246041; US-PATENT-CLASS-331-94.1; US-PATENT-CLASS-331-3; US-PATENT-CLASS-324-304; INT-PATENT-CLASS-H03L-7/26) Avail: US Patent and Trademark Office

A linear ion trap for frequency standard applications is provided with a plurality of trapping rods equally spaced and applied quadruple rf voltages for radial confinement of atomic ions and biased level pins at each end for axial confinement of the ions. The trapping rods are divided into two linear ion trap regions by a gap in each rod in a common radial plane to provide dc discontinuity, thus dc isolating one region from the other. A first region for ion-loading and preparation fluorescence is biased with a dc voltage to transport ions into a second region for resonance frequency comparison with a local oscillator derived frequency while the second region is held at zero voltage. The dc bias voltage of the regions is reversed for transporting the ions back into the first region for fluorescence measurement. The dual mode cycle is repeated continuously for comparison and feedback control of the local oscillator derived frequency. Only the second region requires magnetic shielding for the resonance function which is sensitive to any ambient magnetic fields.

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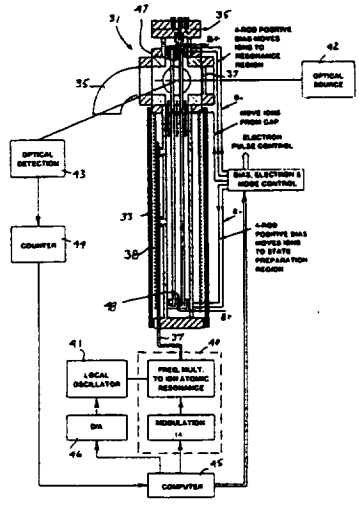


74
OPTICS

Includes light phenomena; and optical devices.

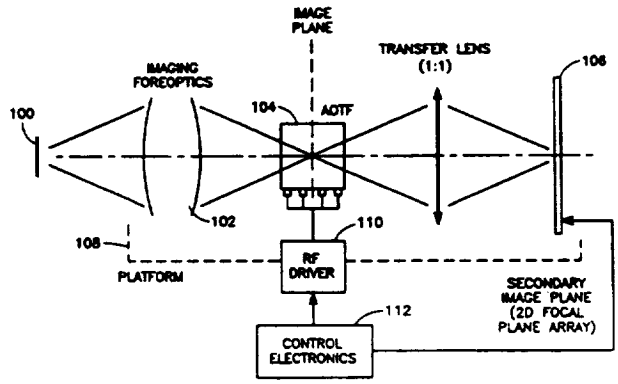
N95-22765* National Aeronautics and Space Administration. Pasadena Office, CA.

PROGRAMMABLE HYPERSPECTRAL IMAGE MAPPER WITH ON-ARRAY PROCESSING Patent

JAMES A. CUTTS, inventor (to NASA) (Jet Propulsion Lab., California Inst. of Tech., Pasadena, CA.) 3 Jan. 1995 17 p Filed 22 Jun. 1992 Supersedes N92-30104 (30 - 20, p 3553)
(Contract(s)/Grant(s): NAS7-918)
(NASA-CASE-NPO-17794-1-CU; US-PATENT-5,379,065; US-PATENT-APPL-SN-904550; US-PATENT-CLASS-348-269; US-PATENT-CLASS-348-207; INT-PATENT-CLASS-H04N-9/04) Avail: US Patent and Trademark Office

A hyperspectral imager includes a focal plane having an array of spaced image recording pixels receiving light from a scene moving relative to the focal plane in a longitudinal direction, the recording pixels being transportable at a controllable rate in the focal plane in the longitudinal direction, an electronic shutter for adjusting an exposure time of the focal plane, whereby recording pixels in an active area of the focal plane are removed there from and stored upon expiration of the exposure time, an electronic spectral filter for selecting a spectral band of light received by the focal plane from the scene during each exposure time and an electronic controller connected to the focal plane, to the electronic shutter and to the electronic spectral filter for controlling (1) the controllable rate at which the recording is transported in the longitudinal direction, (2) the exposure time, and (3) the spectral band so as to record a selected portion of the scene through M spectral bands with a respective exposure time t(sub q) for each respective spectral band q.

Official Gazette of the U.S. Patent and Trademark Office



N95-22807* National Aeronautics and Space Administration. Langley Research Center, Hampton, VA.

OPTICAL FIBER STRAIN SENSOR WITH IMPROVED LINEARITY RANGE Patent

CLAUDIO OLIVEIRA EGALON, inventor (to NASA) (Analytical Services and Materials, Inc., Hampton, VA.) and ROBERT S. ROGOWSKI, inventor (to NASA) 10 Jan. 1995 5 p Filed 21 Dec. 1992 Supersedes N93-19374 (31 - 6, p 1663)
(NASA-CASE-LAR-14857-1-SB; US-PATENT-5,381,493; US-PATENT-APPL-SN-994593; US-PATENT-CLASS-385-13; US-PATENT-CLASS-385-28; US-PATENT-CLASS-385-123; US-PATENT-CLASS-250-227.16; INT-PATENT-CLASS-G02B-6/16) Avail: US Patent and Trademark Office

A strain sensor is constructed from a two mode optical fiber. When the optical fiber is surface mounted in a straight line and the object to which the optical fiber is mounted is subjected to strain within a predetermined range, the light intensity of any point at the

output of the optical fiber will have a linear relationship to strain, provided the intermodal phase difference is less than 0.17 radians.

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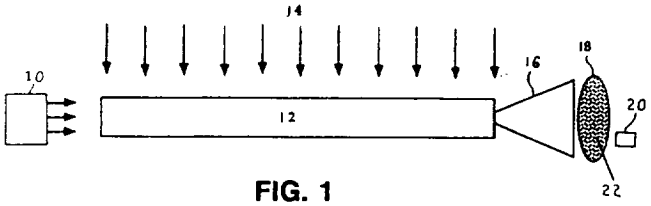


FIG. 1

N95-23045* National Aeronautics and Space Administration. Pasadena Office, CA.

MOTION-SENSITIVE OPTICAL CORRELATOR USING A VANDERLUGT CORRELATOR Patent

TSUEN-HSI LIU, inventor (to NASA) (Jet Propulsion Lab., California Inst. of Tech., Pasadena, CA.) 27 Dec. 1994 7 p Filed 7 Apr. 1993 Supersedes N93-28133 (31 - 10, p 3148)

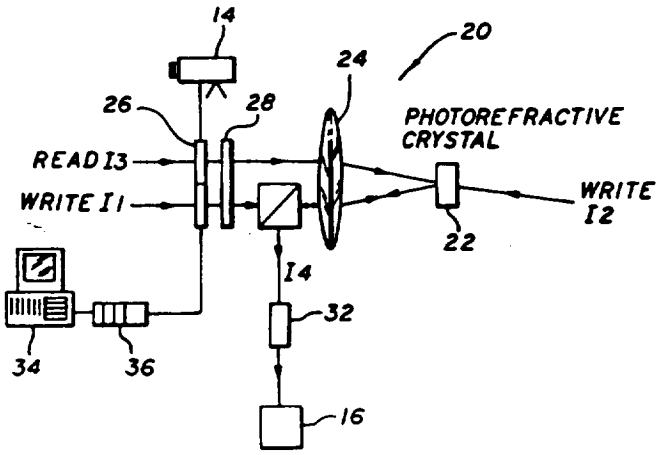
(Contract(s)/Grant(s): NAS7-918)

(NASA-CASE-NPO-18769-1-CU; US-PATENT-5,376,807; US-PATENT-APPL-SN-046331; US-PATENT-CLASS-250-561; US-PATENT-CLASS-359-561; US-PATENT-CLASS-382-42; INT-PATENT-CLASS-G06F-15/336; INT-PATENT-CLASS-G06K-9/64)

Avail: US Patent and Trademark Office

A new type of optical correlator is presented. The correlator performs motion detection or background clutter suppression and correlation simultaneously in a single photorefractive crystal. Additionally, the device is useful for moving target identification and tracking and for stationary clutter rejection. The correlation is of the VanderLugt type, and the motion detection or background clutter suppression is based on the erasing property of photorefractive crystals.

Official Gazette of the U.S. Patent and Trademark Office



N95-23378* National Aeronautics and Space Administration. Ames Research Center, Moffett Field, CA.

RESONANT INFRARED DETECTOR WITH SUBSTANTIALLY UNIT QUANTUM EFFICIENCY Patent

JAM FARHOOMAND, inventor (to NASA) and ROBERT E. MCMURRAY, JR., inventor (to NASA) 1 Mar. 1994 8 p Filed 28 Jan. 1992

(NASA-CASE-ARC-11940-1-SB; US-PATENT-5,291,055; US-PATENT-APPL-SN-827177; US-PATENT-CLASS-257-437; US-PATENT-CLASS-257-436; US-PATENT-CLASS-250-370.14; INT-PATENT-CLASS-H01L-27/14; INT-PATENT-CLASS-H01L-31/00)

Avail: US Patent and Trademark Office

A resonant infrared detector includes an infrared-active layer which has first and second parallel faces and which absorbs radiation of a given wavelength. The detector also includes a first tuned reflective layer, disposed opposite the first face of the infrared-active layer, which reflects a specific portion of the radiation incident thereon and allows a specific portion of the incident radiation at the given wavelength to reach the infrared-active layer. A second reflective layer, disposed opposite the second face of the infrared-active layer, reflects back into the infrared-active layer substantially all of the radiation at the given wavelength which passes through the infrared-active layer. The reflective layers have the effect of increasing the quantum efficiency of the infrared detector relative to the quantum efficiency of the infrared-active layer alone.

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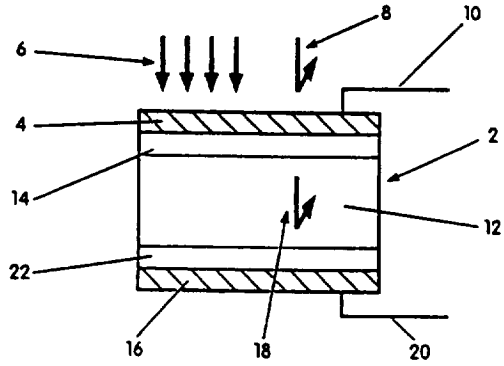

N95-26015* National Aeronautics and Space Administration. Ames Research Center, Moffett Field, CA.

ANGULAR DISPLACEMENT MEASURING DEVICE Patent

H. LEE B. SEEGMILLER, inventor (to NASA) 11 Aug. 1992 7 p Filed 10 Oct. 1991

(NASA-CASE-ARC-11937-1; US-PATENT-5,137,353; US-PATENT-APPL-SN-774490; US-PATENT-CLASS-356-152; US-PATENT-CLASS-356-34; US-PATENT-CLASS-250-225; INT-PATENT-CLASS-G01B-11/16) Avail: US Patent and Trademark Office

A system for measuring the angular displacement of a point of interest on a structure, such as aircraft model within a wind tunnel, includes a source of polarized light located at the point of interest. A remote detector arrangement detects the orientation of the plane of the polarized light received from the source and compares this orientation with the initial orientation to determine the amount or rate of angular displacement of the point of interest. The detector arrangement comprises a rotating polarizing filter and a dual filter and light detector unit. The latter unit comprises an inner aligned filter and photodetector assembly which is disposed relative to the periphery of the polarizer so as to receive polarized light passing the polarizing filter and an outer aligned filter and photodetector assembly which receives the polarized light directly, i.e., without passing

through the polarizing filter. The purpose of the unit is to compensate for the effects of dust, fog and the like. A polarization preserving optical fiber conducts polarized light from a remote laser source to the point of interest.

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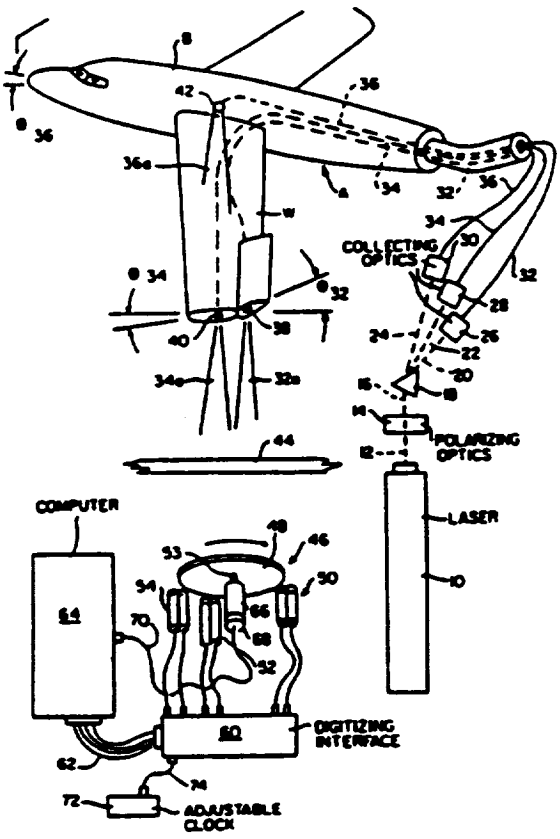

N95-26117* National Aeronautics and Space Administration. Ames Research Center, Moffett Field, CA.

METHOD FOR DETERMINING SHEAR DIRECTION USING LIQUID CRYSTAL COATINGS Patent

DANIEL C. REDA 7 Mar. 1995 6 p Filed 16 Mar. 1993

(NASA-CASE-ARC-11995-1; US-PATENT-5,394,752; US-PATENT-APPL-SN-031972; US-PATENT-CLASS-73-800; US-PATENT-CLASS-356-32; INT-PATENT-CLASS-G01B-11/16; INT-PATENT-CLASS-C09K-19/00) Avail: US Patent and Trademark Office

A method is provided for determining shear direction wherein a beam of white light is directed onto the surface of a liquid crystal coating to cause the white light to be dispersed (reflected) from the surface in a spectrum having bands of different colors in a fixed spatial 2 (angular) sequence. The system is calibrated by locating an observer, e.g., a video and movie camera, such that a particular color band (preferably at or near the center of the reflected spectrum) is observed to thereby provide a reference color band. Because the application of shear causes either clockwise or counterclockwise rotation of the reflected spectrum dependent on the direction of the shear, a determination is then made of the reflected color band observed by the observer when the surface of the liquid crystal is subjected to shear to thereby determine the direction of the shear based on the directional (rotation) relation of the observed color band with respect to the reference color band in the spatial sequence of color bands.

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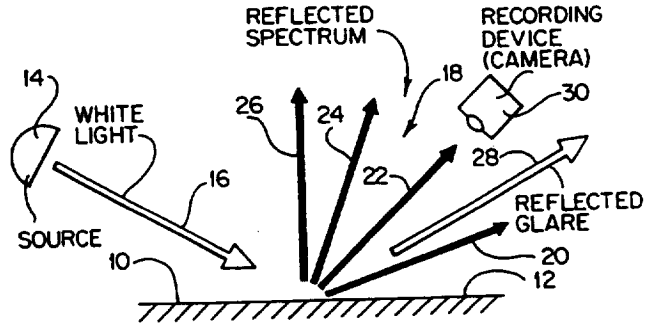

N95-26385* National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, AL.

RADIATION SENSITIVE AREA DETECTION DEVICE AND METHOD Patent

DANIEL C. CARTER, inventor (to NASA), DIANA L. HECHT, inventor (to NASA), WILLIAM K. WITHEROW, inventor (to NASA) et al. 21 Mar. 1995 10 p Filed 6 May 1994

(NASA-CASE-MFS-28563-3; US-PATENT-5,399,877; US-PATENT-APPL-SN-243602; US-PATENT-CLASS-250-581; US-PATENT-CLASS-250-584; US-PATENT-CLASS-250-585; US-PATENT-CLASS-250-586; US-PATENT-CLASS-250-228; US-PATENT-CLASS-356-236; INT-PATENT-CLASS-G03B-42/02) Avail: US Patent and Trademark Office

An area detection device for use with x-ray or ultraviolet radiation wherein light from an integrating device is passed through an optical fiber to fall on a phosphor-containing film which is capable of storing a diffraction pattern formed by the transmission of x-rays or ultraviolet radiation through a sample when the diffraction pattern is projected onto the film and also being capable of fluorescing in correspondence to the diffraction pattern. Fluoresced light from the film is directed back along the fiber and into the integrating device and is fed from the integrating device to photomultiplier which sends a signal from which the diffraction pattern can be detected.

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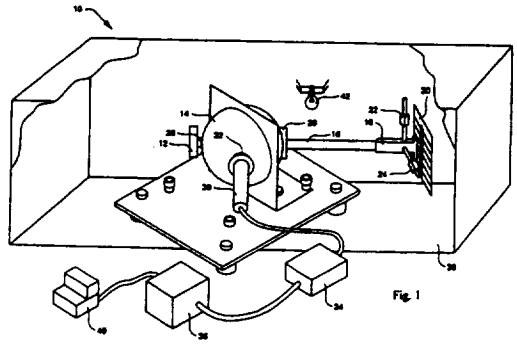


N95-26894*# National Aeronautics and Space Administration. Pasadena Office, CA.

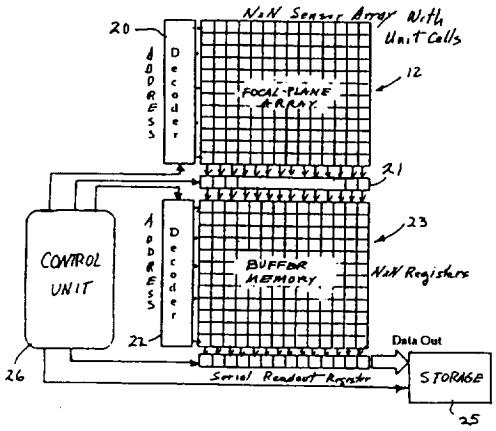
SOLID-STATE IMAGE SENSOR WITH FOCAL-PLANE DIGITAL PHOTON-COUNTING PIXEL ARRAY Patent Application

ERIC R. FOSSUM, inventor (to NASA) (Jet Propulsion Lab., California Inst. of Tech., Pasadena, CA.) and BEDABRATA PAIN, inventor (to NASA) (Jet Propulsion Lab., California Inst. of Tech., Pasadena, CA.) 12 Jan. 1995 67 p

(NASA-CASE-NPO-18518-1-CU; NAS 1.71:NPO-18518-1-CU; US-PATENT-APPL-SN-372640) Avail: CASI HC A04/MF A01

A photosensitive layer such as a-Si for a UV/visible wavelength band is provided for low light level imaging with at least a separate CMOS amplifier directly connected to each PIN photodetector diode to provide a focal-plane array of NxN pixels, and preferably a separate photon-counting CMOS circuit directly connected to each CMOS amplifier, although one row of counters may be time shared for reading out the photon flux rate of each diode in the array, together with a buffer memory for storing all rows of the NxN image frame before transfer to suitable storage. All CMOS circuitry is preferably fabricated in the same silicon layer as the PIN photodetector diode for a monolithic structure, but when the wavelength band of interest requires photosensitive material different from silicon, the focal-plane array may be fabricated separately on a different semiconductor layer bump-bonded or otherwise bonded for a virtually monolithic structure with one free terminal of each diode directly connected to the input terminal of its CMOS amplifier and digital counter for integration of the photon flux rate at each photodetector of the array.

NASA



N95-27843* National Aeronautics and Space Administration. Pasadena Office, CA.

DISPLAY SYSTEM EMPLOYING ACOUSTO-OPTIC TUNABLE FILTER Patent

JAMES L. LAMBERT, inventor (to NASA) (Jet Propulsion Lab., California Inst. of Tech., Pasadena, CA.) 25 Apr. 1995 10 p Filed 7 Jun. 1993 Supersedes N94-15933 (32 - 3, p 1190)

(Contract(s)/Grant(s): NAS7-918)

(NASA-CASE-NPO-18736-1-CU; US-PATENT-5,410,371; US-PATENT-APPL-SN-073235; US-PATENT-CLASS-348-769; US-PATENT-CLASS-348-754; US-PATENT-CLASS-359-285; INT-PATENT-CLASS-H04N-5/74) Avail: US Patent and Trademark Office

An acousto-optic tunable filter (AOTF) is employed to generate a display by driving the AOTF with a RF electrical signal comprising modulated red, green, and blue video scan line signals and scanning the AOTF with a linearly polarized, pulsed light beam, resulting in encoding of color video columns (scan lines) of an input video image into vertical columns of the AOTF output beam. The AOTF is illuminated periodically as each acoustically-encoded scan line fills the cell aperture of the AOTF. A polarizing beam splitter removes the unused first order beam component of the AOTF output and, if desired, overlays a real world scene on the output plane. Resolutions as high as 30,000 lines are possible, providing holographic display capability.

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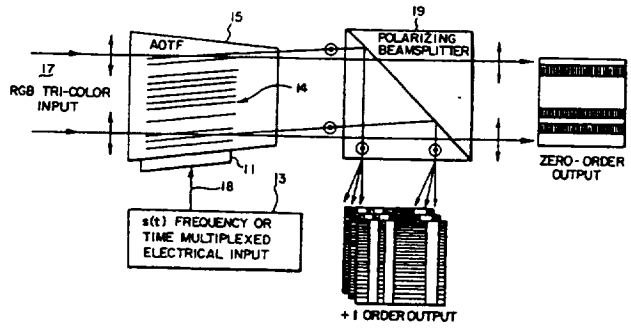

N95-28363* National Aeronautics and Space Administration. Pasadena Office, CA.

OPTICAL IMPLEMENTATION OF INNER PRODUCT NEURAL ASSOCIATIVE MEMORY Patent

HUA-KUANG LIU, inventor (to NASA) 2 May 1995 9 p Filed 8 Feb. 1994

(NASA-CASE-NPO-18491-2-CU; US-PATENT-5,412,755; US-PATENT-APPL-SN-195737; US-PATENT-CLASS-395-25; INT-PATENT-CLASS-G06F-15/18) Avail: US Patent and Trademark Office

An optical implementation of an inner-product neural associative memory is realized with a first spatial light modulator for entering an initial two-dimensional N-tuple vector and for entering a thresholded output vector image after each iteration until convergence is reached, and a second spatial light modulator for entering M weighted vectors of inner-product scalars multiplied with each of the M stored vectors, where the inner-product scalars are produced by multiplication of the initial input vector in the first iterative cycle (and thresholded vectors in subsequent iterative cycles) with each of the M stored vectors, and the weighted vectors are produced by multiplication of the scalars with corresponding ones of the stored vectors. A Hughes liquid crystal light valve is used for the dual function of summing the weighted vectors and thresholding the sum vector. The thresholded vector is then entered through the first spatial light modulator for reiteration of the process cycle until convergence is reached.

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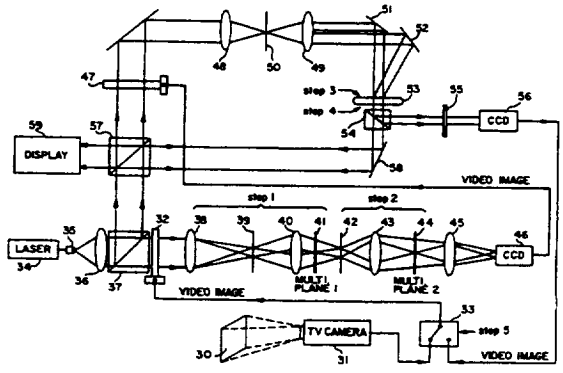

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NASA *patent application specifications* are sold in paper copy and microfiche by the NASA Center for AeroSpace Information (CASI). The N accession number should be used in ordering either paper copy or microfiche from CASI.

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The NASA Patent Counsel having cognizance of the invention is determined by the first three letters or prefix of the NASA Case Number assigned to the invention. The addresses of NASA Patent Counsels are listed alongside the NASA Case Number prefix letters in the following table.

STANDING ORDER SUBSCRIPTIONS

NASA SP-7039, Section 1 and its supplements are available from the NASA Center for AeroSpace Information on standing order subscription. Standing order subscriptions do not terminate at the end of a year, as do regular subscriptions, but continue indefinitely unless specifically terminated by the subscriber.

NASA Case Number Prefix Letters	Address of Cognizant NASA Patent Counsel
ARC-xxxxx XAR-xxxxx	Ames Research Center Mail Code: 200-11A Moffett Field, California 94035 Telephone: (415) 694-5104
ERC-xxxxx XER-xxxxx HQN-xxxxx XHQ-xxxxx	NASA Headquarters Mail Code: GP Washington, DC 20546 Telephone: (202) 358-2066
GSC-xxxxx XGS-xxxxx	Goddard Space Flight Center Mail Code: 204 Greenbelt, Maryland 20771 Telephone: (301) 286-7351
KSC-xxxxx XKS-xxxxx	John F. Kennedy Space Center Mail Code: PT-PAT Kennedy Space Center, Florida 32899 Telephone: (305) 867-2544
LAR-xxxxx XLA-xxxxx	Langley Research Center Mail Code: 279 Hampton, Virginia 23365 Telephone: (804) 865-3725
LEW-xxxxx XLE-xxxxx	Lewis Research Center Mail Code: 500-318 21000 Brookpark Road Cleveland, Ohio 44135 Telephone: (216) 433-5753
MSC-xxxxx XMS-xxxxx	Lyndon B. Johnson Space Center Mail Code: AL3 Houston, Texas 77058 Telephone: (713) 483-4871
MFS-xxxxx XMF-xxxxx	George C. Marshall Space Flight Center Mail Code: CC01 Huntsville, Alabama 35812 Telephone: (205) 544-0024
NPO-xxxxx XNP-xxxxx FRC-xxxxx XFR-xxxxx WOO-xxxxx	NASA Resident Legal Office Mail Code: 180-801 4800 Oak Grove Drive Pasadena, California 91103 Telephone: (818) 354-2700

PATENT LICENSING REGULATIONS

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
14 CFR Part 1245
Patents and Other Intellectual Property Rights

AGENCY: National Aeronautics and Space Administration (NASA).

Action: Final rule.

SUMMARY: NASA is amending 14 CFR Part 1245 by removing Subpart 2, "Licensing of NASA Inventions." The Department of Commerce has issued similar regulations which prescribe the terms, conditions, and procedures upon which a federally-owned invention may be licensed. These regulations are codified at 37 CFR Part 404, *"Licensing of Government Owned Inventions."* NASA began granting licenses in accordance with the Department of Commerce regulations on March 13, 1995. All licenses agreements executed prior to this date will operate under the previous regulations.

EFFECTIVE DATE: March 13, 1995.

FOR FURTHER INFORMATION CONTACT:
John G. Mannix, (202) 358-2424.

List of Subjects in 14 CFR Part 1245

Authority delegations (Government agencies), Inventions and patents.

Under the authority, 42 U.S.C. 2473, 14 CFR Part 1245 is amended as follows:

PART 1245—[AMENDED]

Subpart 2—[Removed and Reserved]

In 14 CFR Part 1245, Subpart 2 (consisting of SS 1245.200 through 1245.214) is removed and reserved.

Dated: April 24,1995.

Edward A. Frankle,
General Counsel.

[FR Doc. 95—10583 Filed 4-28-95, 8:45 am]

BILLING CODE 7510–01–M

Code of Federal Regulations
37 CFR Part 404
Licensing of Government Owned Inventions

Sec.

Sec. 404.1 Scope of part.

This part prescribes the terms, conditions, and procedures upon which a federally owned invention, other than an invention in the custody of the Tennessee Valley Authority, may be licensed. It supersedes the regulations at 41 CFR Subpart 101-4.1. This part does not affect licenses which (a) were in effect prior to July 1, 1981; (b) may exist at the time of the Government's acquisition of title to the invention, including those resulting from the allocation of rights to inventions made under Government research and development contracts; (c) are the result of an authorized exchange of rights in the settlement of patent disputes; or (d) are otherwise authorized by law or treaty.

Sec. 404.2 Policy and objective.

It is the policy and objective of this subpart to use the patent system to promote the utilization of inventions arising from federally supported research or development.

Sec. 404.3 Definitions.

(a) *'Federally owned invention'* means an invention, plant, or design which is covered by a patent, or patent application in the United States, or a patent, patent application, plant variety protection, or other form of protection, in a foreign country, title to which has been assigned to or otherwise vested in the United States Government.

(b) *'Federal agency'* means an executive department, military department, Government corporation, or independent establishment, except the Tennessee Valley Authority, which has custody of a federally owned invention.

(c) *'Small business firm'* means a small business concern as defined in section 2 of Pub. L. 85-536 (15 U.S.C. 632) and implementing regulations of the Administrator of the Small Business Administration.

(d) *'Practical application'* means to manufacture in the case of a composition or product, to practice in the case of a process or method, or to operate in the case of a machine or system; and, in each case, under such conditions as to establish that the invention is being utilized and that its benefits are to the extent permitted by law or Government regulations available to the public on reasonable terms.

(e) *'United States'* means the United States of America, its territories and possessions, the District of Columbia, and the Commonwealth of Puerto Rico.

Sec. 404.4 Authority to grant licenses.

Federally owned inventions shall be made available for licensing as deemed appropriate in the public interest. Federal agencies having custody of federally owned inventions may grant nonexclusive, partially exclusive, or exclusive licenses thereto under this part.

Sec. 404.5 Restrictions and conditions on all licenses granted under this part.

(a) (1) A license may be granted only if the applicant has supplied the Federal agency with a satisfactory plan for development or marketing of the invention, or both, and with information about the applicant's capability to fulfill the plan.

(2) A license granting rights to use or sell under a federally owned invention in the United States shall normally be granted only to a licensee who agrees that any products embodying the invention or produced through the use of the invention will be manufactured substantially in the United States.

(b) Licenses shall contain such terms and conditions as the Federal agency determines are appropriate for the protection of the interests of the Federal Government and the public and are not in conflict with law or this part. The following terms and conditions apply to any license:

(1) The duration of the license shall be for a period specified in the license agreement, unless sooner terminated in accordance with this part.

(2) The license may be granted for all or less than all fields of use of the invention or in specified geographical areas, or both.

(3) The license may extend to subsidiaries of the licensee or other parties if provided for in the license but shall be nonassignable without approval of the Federal agency, except to the successor of that part of the licensee's business to which the invention pertains.

(4) The licensee may provide the license the right to grant sublicenses under the license, subject to the approval of the Federal agency. Each sublicense shall make reference to the license, including the rights retained by the Government, and a copy of such sublicense shall be furnished to the Federal agency.

(5) The license shall require the licensee to carry out the plan for development or marketing of the invention, or both, to bring the invention to practical application within a period specified in the license, and to continue to make the benefits of the invention reasonably accessible to the public.

(6) The license shall require the licensee to report periodically on the utilization or efforts at obtaining utilization that are being made by the licensee, with particular reference to the plan submitted.

(7) Licenses may be royalty-free or for royalties or other consideration.

(8) Where an agreement is obtained pursuant to Sec.404.5(a) (2) that any products embodying the invention or produced through use of the invention will be manufactured substantially in the United States, the license shall recite such agreement.

(9) The license shall provide for the right of the Federal agency to terminate the license, in whole or in part, if:

(i) The Federal agency determines that the licensee is not executing the plan submitted with its request for a license and the licensee cannot otherwise demonstrate to the satisfaction of the Federal agency that it has taken or can be expected to take within a reasonable time effective steps to achieve practical application of the invention;

(ii) The Federal agency determines that such action is necessary to meet requirements for public use specified by Federal regulations issued after the date of the license and such requirements are not reasonably satisfied by the licensee;

(iii) The licensee has willfully made a false statement of or willfully omitted a material fact in the license application or in any report required by the license agreement; or

(iv) The licensee commits a substantial breach of a covenant or agreement contained in the license.

(10) The license may be modified or terminated, consistent with this part, upon mutual agreement of the Federal agency and the licensee.

(11) Nothing relating to the grant of a license, nor the grant itself, shall be construed to confer upon any person any immunity from or defenses under the antitrust laws or from a charge of patent misuse, and the acquisition and use of rights pursuant to this part shall not be immunized from the operation of state or Federal law by reason of the source of the grant.

Sec. 404.6 Nonexclusive licenses.

(a) Nonexclusive licenses may be granted under federally owned inventions without publication of availability or notice of a prospective license.

(b) In addition to the provisions of Sec. 404.5, the nonexclusive license may also provide that, after termination of a period specified in the license agreement, the Federal agency may restrict the license to the fields of use or geographic areas, or both, in which the licensee has brought the invention to practical application and continues to make the benefits of the invention reasonably accessible to the public. However, such restriction shall be made only in order to grant an exclusive or partially exclusive license in accordance with this subpart.

Sec. 404.7 Exclusive and partially exclusive licenses.

(a) (1) Exclusive or partially exclusive domestic licenses may be granted on federally owned inventions three months after notice of the invention's availability has been announced in the Federal Register, or without such notice where the Federal agency determines that expeditious granting of such a license will best serve the interest of the Federal Government and the public; and in either situation, only if;

(i) Notice of a prospective license, identifying the invention and the prospective licensee, has been published in the Federal Register, providing opportunity for filing written objections within a 60-day period;

(ii) After expiration of the period in Sec. 404.7(a)(1)(i) and consideration of any written objections received during the period, the Federal agency has determined that;

(A) The interests of the Federal Government and the public will best be served by the proposed license, in view of the applicant's intentions, plans, and ability to bring the invention to practical application or otherwise promote the invention's utilization by the public;

(B) The desired practical application has not been achieved, or is not likely expeditiously to be achieved, under any nonexclusive license which has been granted, or which may be granted, on the invention;

(C) Exclusive or partially exclusive licensing is a reasonable and necessary incentive to call forth the investment of risk capital and expenditures to bring the invention to practical application or otherwise promote the invention's utilization by the public; and

(D) The proposed terms and scope of exclusivity are not greater than reasonably necessary to provide the incentive for bringing the invention to practical application or otherwise promote the invention's utilization by the public;

(iii) The Federal agency has not determined that the grant of such license will tend substantially to lessen competition or result in undue concentration in any section of the country in any line of commerce to which the technology to be licensed relates, or to create or maintain other situations inconsistent with the antitrust laws; and

(iv) The Federal agency has given first preference to any small business firms submitting plans that are determined by the agency to be within the capabilities of the firms and as equally likely, if executed, to bring the invention to practical application as any plans submitted by applicants that are not small business firms.

(2) In addition to the provisions of Sec. 404.5, the following terms and conditions apply to domestic exclusive and partially exclusive licenses;

(i) The license shall be subject to the irrevocable, royalty-free right of the Government of the United States to practice and have practiced the invention on behalf of the United States and on behalf of any foreign government or international organization pursuant to any existing or future treaty or agreement with the United States.

(ii) The license shall reserve to the Federal agency the right to require the licensee to grant sublicenses to responsible appli-

cants, on reasonable terms, when necessary to fulfill health or safety needs.

(iii) The license shall be subject to any licenses in force at the time of the grant of the exclusive or partially exclusive license.

(iv) The license may grant the licensee the right of enforcement of the licensed patent pursuant to the provisions of Chapter 29 of Title 35, United States Code, or other statutes, as determined appropriate in the public interest.

(b) (1) Exclusive or partially exclusive licenses may be granted on a federally owned invention covered by a foreign patent, patent application, or other form of protection, provided that;

(i) Notice of a prospective license, identifying the invention and prospective licensee, has been published in the Federal Register, providing opportunity for filing written objections within a 60-day period and following consideration of such objections;

(ii) The agency has considered whether the interests of the Federal Government or United States industry in foreign commerce will be enhanced; and

(iii) The Federal agency has not determined that the grant of such license will tend substantially to lessen competition or result in undue concentration in any section of the United States in any line of commerce to which the technology to be licensed relates, or to create or maintain other situations inconsistent with antitrust laws.

(2) In addition to the provisions of Sec. 404.5 the following terms and conditions apply to foreign exclusive and partially exclusive licenses:

(i) The license shall be subject to the irrevocable, royalty-free right of the Government of the United States to practice and have practiced the invention on behalf of the United States and on behalf of any foreign government or international organization pursuant to any existing or future treaty or agreement with the United States.

(ii) The license shall be subject to any licenses in force at the time of the grant of the exclusive or partially exclusive license.

(iii) The license may grant the licensee the right to take any suitable and necessary actions to protect the licensed property, on behalf of the Federal Government.

(c) Federal agencies shall maintain a record of determinations to grant exclusive or partially exclusive licenses.

Sec. 404.8 Application for a license.

An application for a license should be addressed to the Federal agency having custody of the invention and shall normally include:

(a) Identification of the invention for which the license is desired including the patent application serial number or patent number, title, and date, if known;

(b) Identification of the type of license for which the application is submitted;

(c) Name and address of the person, company, or organization applying for the license and the citizenship or place of incorporation of the applicant;

(d) Name, address, and telephone number of the representative of the applicant to whom correspondence should be sent;

(e) Nature and type of applicant's business, identifying products or services which the applicant has successfully commercialized, and approximate number of applicant's employees;

(f) Source of information concerning the availability of a license on the invention;

(g) A statement indicating whether the applicant is a small business firm as defined in Sec.404.3(c)

(h) A detailed description of applicant's plan for development or marketing of the invention, or both, which should include:

(1) A statement of the time, nature and amount of anticipated investment of capital and other resources which applicant believes will be required to bring the invention to practical application;

(2) A statement as to applicant's capability and intention to fulfill the plan, including information regarding manufacturing, marketing, financial, and technical resources;

(3) A statement of the fields of use for which applicant intends to practice the invention; and

(4) A statement of the geographic areas in which applicant intends to manufacture any products embodying the invention and geographic areas where applicant intends to use or sell the invention, or both;

(i) Identification of licenses previously granted to applicant under federally owned inventions;

(j) A statement containing applicant's best knowledge of the extent to which the invention is being practiced by private industry or Government, or both, or is otherwise available commercially; and

(k) Any other information which applicant believes will support a determination to grant the license to applicant.

Sec. 404.9 Notice to Attorney General.

A copy of the notice provided for in Sec. 404.7(a)(1)(i) and (b)(1)(i) will be sent to the Attorney General.

Sec. 404.10 Modification and termination of licenses.

Before modifying or terminating a license, other than by mutual agreement, the Federal agency shall furnish the licensee and any sublicensee of record a written notice of intention to modify or terminate the license, and the licensee and any sublicensee shall be allowed 30 days after such notice to remedy any breach of the license or show cause why the license shall not be modified or terminated.

Sec. 404.11 Appeals.

In accordance with procedures prescribed by the Federal agency, the following parties may appeal to the agency head or designee any decision or determination concerning the grant, denial, interpretation, modification, or termination of a license:

(a) A person whose application for a license has been denied.

(b) A licensee whose license has been modified or terminated, in whole or in part; or

(c) A person who timely filed a written objection in response to the notice required by Sec. 404.7(a)(1)(i) or Sec. 404.7(b)(1)(i) and who can demonstrate to the satisfaction of the Federal agency that such person may be damaged by the agency action.

Sec. 404.12 Protection and administration of inventions.

A Federal agency may take any suitable and necessary steps to protect and administer rights to federally owner inventions, either directly or through contract.

Sec. 404.13 Transfer of custody.

A Federal agency having custody of a federally owned invention may transfer custody and administration, in whole or in part, to another Federal agency, of the right, title, or interest in such invention.

Sec. 404.14 Confidentiality of information.

Title 35, United States Code, section 209, provides that any plan submitted pursuant to Sec. 404.8 (h) and any report required by Sec. 404.5(b)(6) may be treated by the Federal agency as commercial and financial information obtained from a person and privileged and confidential and not subject to disclosure under section 552 of Title 5 of the United States Code.

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